Heating and Ventilating

For Engineers and Contractors Controlling the Design, Specification, Installation and Maintenance of Heating, Ventilating and Air Conditioning

Volume 31 **JUNE, 1934** **Number 6**

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Published Monthly by

THE INDUSTRIAL PRESS, 148 LAFAYETTE STREET, NEW YORK

ROBERT B. LUCHARS President — EDGAR A. BECKER, Vice-Pres. and Treasurer — ERIK OBERG Secretary

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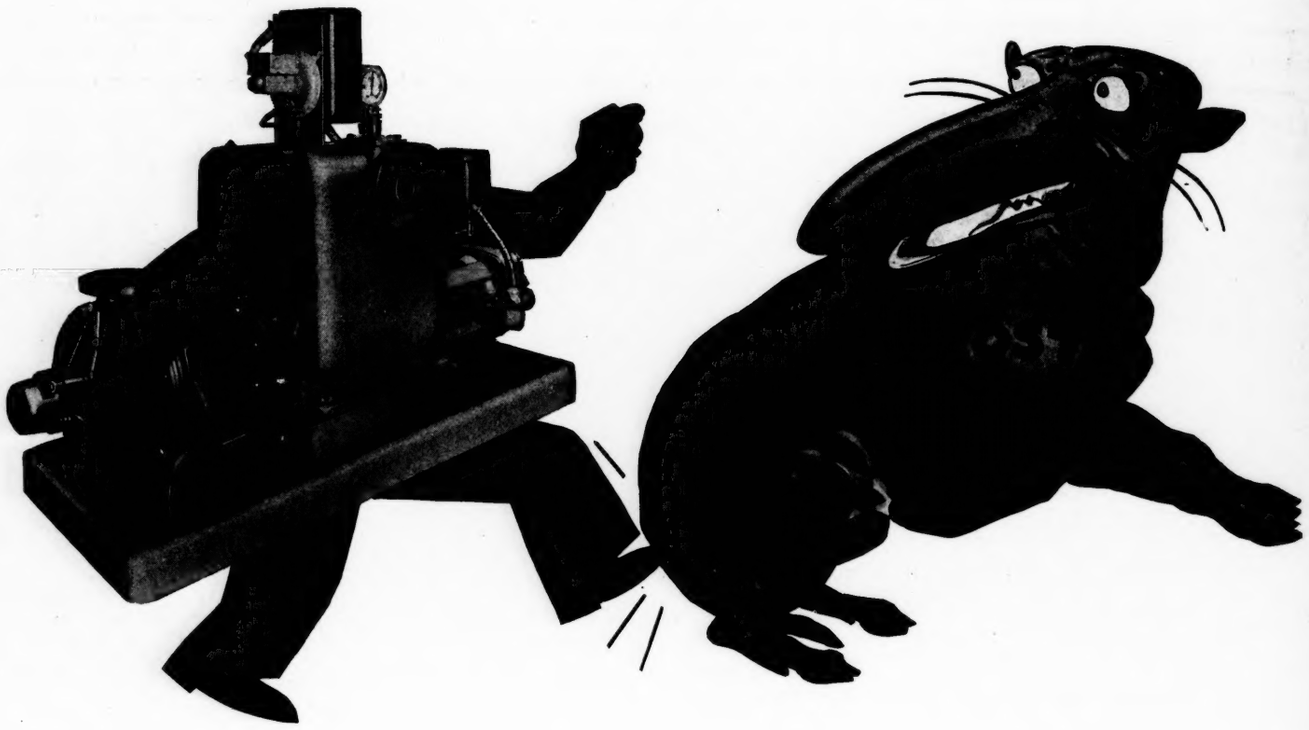
Subscription, $2 per year in United States and Mexico. $2.50 in Canada. $3 all other countries. Single copies regular issue, 30 cents; special issues, $1.

THIS MODERN HEATING PUMP KICKS SLATS OUT OF HEATING COST



That fearsome creature, Big Heating Cost, better known as Big Bill, holds no terrors for the Jennings Vapor Turbine Heating Pump. Whenever the aid of the Vapor Turbine is enlisted in plants where Big Bill has taken up his quarters, the Vapor Turbine immediately proceeds to kick this steam hog into oblivion.

But Vapor Turbine, the old Steam Saver, has everything in his favor. He derives his strength from the fact that it costs so little to maintain him. For, in the first place, the Vapor Turbine requires no electric current, which immediately eliminates the one biggest item in cost of operating an ordinary vacuum return line heating pump.

But the really big advantage the Vapor Turbine has is that it can operate continuously with economy. Continuous operation of course means continuous removal of air and condensate from the heating system. Any engineer knows that this uniform circulation is a most important factor in steam saving.

The Vapor Turbine can kick the spots out of Big Heating Bill in your plant, and is rarin' to go. Just send your name and address for full details.

THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

Washington's New District Heating Plant

A description of the distribution system supplying steam to 42 of the Capital's largest buildings

By PIERCE TIMMIS†

THE distribution system of the new Central Heating Plant for Public Buildings now serves 42 of the Federal and semi-Federal buildings in the Triangle and West Potomac Park areas. Other buildings will be added as they are completed. A key plan showing the general layout of the system and an index of the buildings served is shown in Fig. 1.

The buildings vary in size from about 25,000 cu. ft. to 27,000,000 cu. ft. and the maximum steam demand from a few pounds to 85,000 lb. per hr. The maximum steam demand on the Central Plant is expected to approximate 850,000 lb. per hr. when all buildings included in the ultimate scope are added. While most of the buildings are of the office type they vary considerably in construction from frame and stucco wartime temporary buildings to the monumental stone and brick structures exemplified by the new Commerce Building and the Agriculture Extensible Building.

While the greatest steam demand is for comfort heating, there are many other uses, as for instance in the several Government cafeterias, analytical and research laboratories, and in the Bureau of Engraving and Printing for manufacturing and service purposes.

With the exception of the conduit run across the Ellipse south of the White House, all main steam distribution piping is run in tunnels and the branches from the tunnels to individual buildings in conduit. There are about 18,000 linear ft. of tunnel ranging in cross section from 4 ft. wide by 6 ft. 6 in. high to 8 ft. wide by 7 ft. high and approximately 9,000 linear ft. of conduit with external dimensions of 2 ft. 6 in. high by 2 ft. 5 in. wide to 3 ft. high by 5 ft. wide.

Prior to a final decision on the route of the tunnel

†Service Equipment Engineer, United Engineers & Constructors Inc.

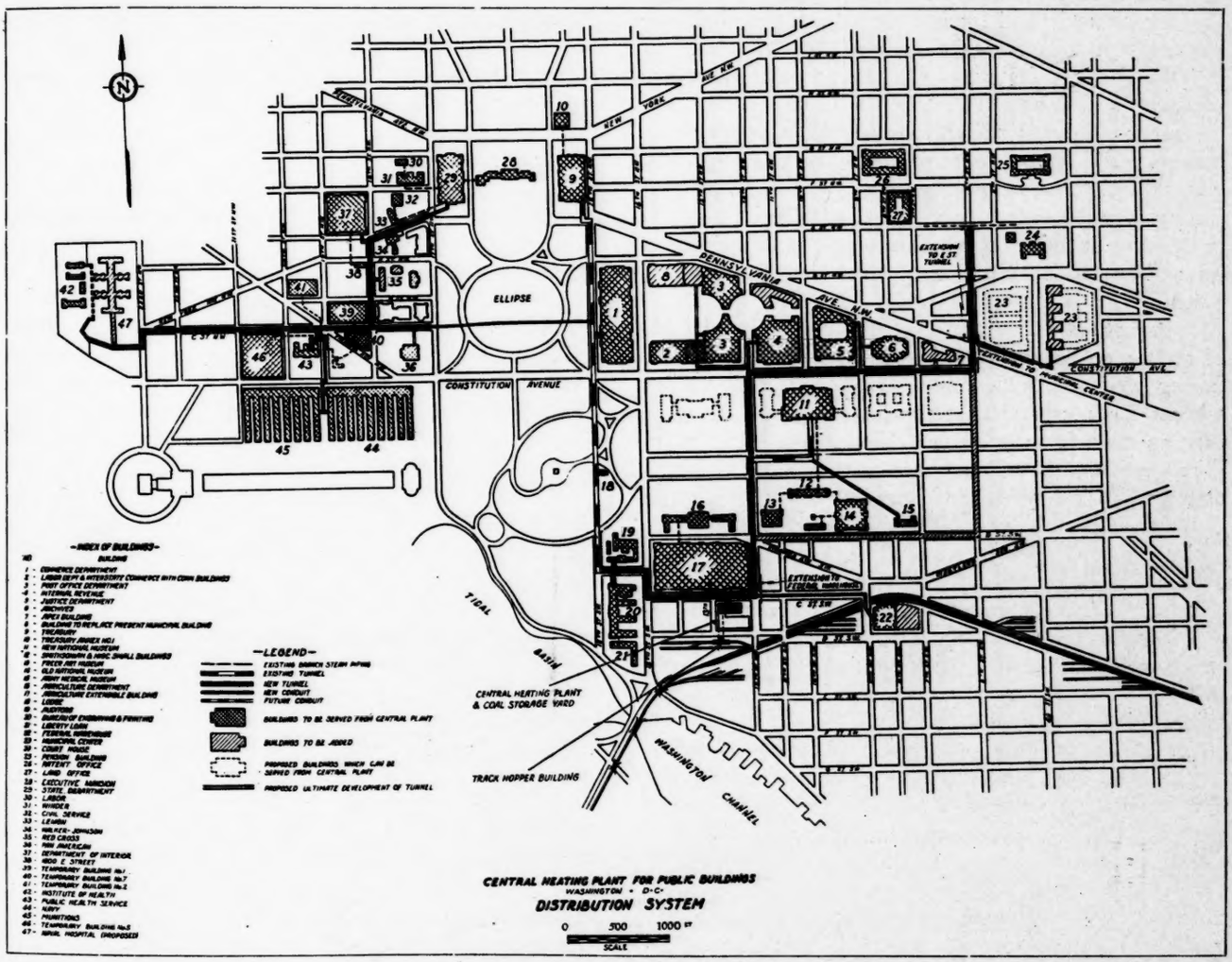


Fig. 1. Plan of the Washington district heating plant.

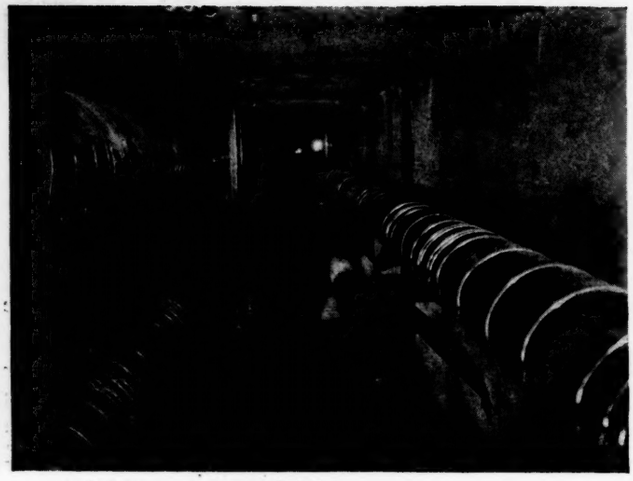


Fig. 2. Typical run of tunnel, with steam lines on left and returns on right. Note sleeve guides and supports.

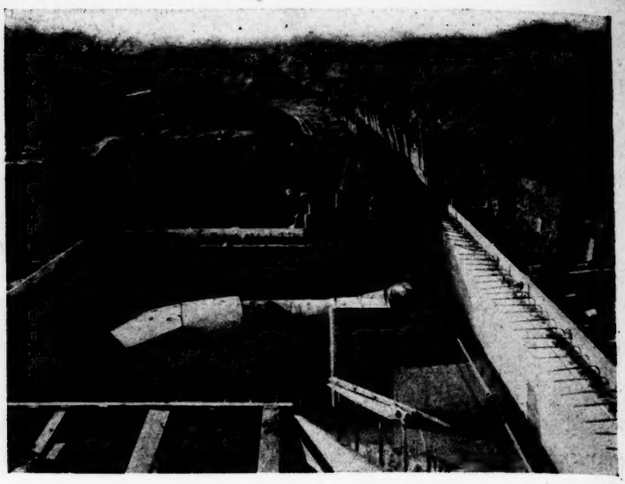


Fig. 3. Conduit run across the Ellipse, showing corrugated expansion loop in the 18-in. steam line.

system and the location of the tunnels and conduit with relation to existing structures, a complete topographical survey of the proposed route was made, as no accurate coordinate survey then existed. This survey showed the location of all manholes in all street utility lines and, in addition, the elevations of all conduits, pipes, and cables entering or leaving the manholes so that it was possible to plot, with some approach to accuracy, the underground obstructions to be dealt with. The number of uncharted interferences encountered during construction were remarkably few.

One important feature of the survey was the locating of large trees along the route. Washington is proud of its trees, and every precaution was taken to avoid the necessity for removing or endangering desirable ones either during tunnel construction or afterwards by subjecting them to tunnel heat. Small shrubs and bushes in the way of tunnel excavation were moved to nurseries and replaced after tunnel construction was completed.

In laying out the distribution system use was made of certain portions of existing tunnels which were built during 1915 and which were the result of an earlier scheme for a central heating plant. Such portions of existing tunnels may be identified on the key plan. Wherever possible, tunnels were located in parked areas between the sidewalks and buildings or through the grounds, to avoid disturbing street surfaces.

For the most part the tops of tunnels are from 8 ft. to 10 ft. from the ground surface. The greatest depth of tunnel bottom below ground surface is approximately 35 ft. at the intersection of D and 18th Streets, N.W., where the tunnel passes under a large sewer in D Street. No waterproofing was used on tunnel work, reliance being placed on dense concrete of suitable thickness. To provide a sure foothold, steps instead of ramps were used wherever the grade of tunnel floor was steeper than 10%. A typical run of tunnel is shown in Fig. 2 and a conduit run in Fig. 3.

Besides the usual manhole inlets to the tunnels for material and inspection, emergency exits are provided at intervals of approximately 1200 ft. These exits which also serve as ventilators for the tunnel, are provided with counterbalanced grating covers which open part way when the latch is released. The latch may be easily released from the tunnel side but requires a key for operation from the outside. Emergency exit lights are placed at emergency exits in the tunnel.

Each manhole housing expansion joints or traps, in the conduit system, is provided with two top inlets to aid natural ventilation or to permit the application of forced ventilation at times when work is being done in the manhole. The sump pumps are capable of unwatering the tunnels in about 18 hr. should they ever become flooded.

The distribution system is designed to carry steam at 300 lb. per sq. in. pressure, saturated, but 200 lb. pressure will be used for the present. There are three 18-in. steam lines leaving the Central Plant; two of these lines are installed in the 15th Street tunnel, one extends all the way to the Treasury Building and serves all the buildings along the route, the second turns west across the Ellipse to serve the buildings in the West Potomac Park Area. The third line goes north up 12th Street and serves the buildings in the Triangle area. Provision is made in this tunnel for the installation of a future main to parallel the present one. When the area along south B Street between 12th Street and 4½ Street is developed there is room in the tunnel for a fifth 18-in. line to serve this area. The total length of steam piping is installed in tunnels and conduit and in the buildings is approximately 75,000 ft. In each building which existed at the time the system was installed a pressure reducing valve arrangement was provided to reduce the steam pressure to that formerly carried in the individual boiler plant. In the new buildings under construction pressure reducing valve arrangements were provided by others as part of the building contract. In the Treasury Building all floors but the fourth are heated with hot water, so hot water converters were installed to replace the coal-fired hot water boilers.

Condensate from all the Triangle buildings and all buildings south of the Triangle is returned to the Central Plant. It was not found to be economical to return this condensate from more distant buildings. Where condensate is not returned to the Central Plant it is disposed of through heat exchangers in one or other

of the buildings. The exchangers are designed to raise the temperature of the cold water supply to domestic hot water heaters, which also accomplishes the purpose of cooling the condensate before disposing of it.

All pipe for steam and return lines in tunnels and for the steam lines in conduit is of seamless steel tubing 400 lb. Standard. Condensate and trap discharge lines in conduits are of Grade A unfinished brass piping. All piping 1½-in. and larger is welded and all welds are normalized. Normalizing is carried out by bringing the temperature of the finished weld up to about 1200° and allowing it to cool slowly under a blanket of insulating material. Van Stone flanges are used at valves and expansion joints. All welds in piping 6 in. and larger in the tunnels are reinforced by sleeves or straps, electrically welded to the pipe. The purposes of reinforcing the welded joints was to prevent a complete break in the remote possibility that a weld should fail. All welding was done to meet the highest standards for this class of work by men qualified through welding tests. The reinforcing of a pipe weld may be seen in Fig. 4.

Wherever possible, expansion loops of corrugated pipe were used to provide for the expansion and contraction of piping. Where this was not possible slip tube, externally and internally guided, expansion joints were used except when the length of pipe involved was less than 60 ft., in which case packless expansion joints of the diaphragm type were used. Where elbows were required they were usually formed on the end of a pipe length by creasing, reducing the number of fittings and the amount of welding.

Guides for piping are of the sleeve type, in which a four-arm spider bolted to the steam line is free to move laterally with the pipe inside the sleeve. The sleeves are spaced about 35 ft. apart and are anchored to the tunnel construction. This arrangement insures good alignment between expansion loops or joints, which, in general, are 400 ft. apart.

All high-pressure steam piping is insulated with 3 in. of felted asbestos put on in two 1½-in. layers. Each layer is attached with copper binding wire. The outermost layer of felted asbestos is protected by an asphaltic impregnated asbestos felt. The binding rings of copper wire are spaced not more than 6 in. on centers. Low-pressure piping and return lines are installed with two layers of insulation each 1 in. thick, also protected by asphaltic impregnated felt.

The drainage system for the piping consists of inverted type steam traps located at anchor points. Trap inlets are taken from drip pockets on the underside of the pipe or from the low points between the ends of the sleeves in a double slip expansion joint. In some cases the traps discharge directly to the main condensate return line from the buildings, and in other cases to receiving tanks in buildings along the route.

Integrating steam flow meters are used for measuring steam to the buildings. Except in two or three cases metering is done in two stages; the base load up to 25% of the maximum demand is taken on one meter and all loads above this point on another. This insures greater accuracy in the lower ranges, which is particularly desirable, as the daily and seasonal demands vary greatly in most of the buildings.

The steam pressures at the three terminal points of the system, that is at the junction of 6th and E Streets, N.W., at the Treasury Building and at the Naval Hospital, are recorded on instruments in the Central Heating Plant so that pressure drop may be observed.

The pressure reducing valves installed in the buildings under this contract are of the auxiliary pilot-operated diaphragm type designed to open against steam pressure. Diaphragms are of phosphor bronze. In most of the buildings two or three reducing valves are provided in parallel to take care of wide ranges in demand. A typical reducing valve station is shown in Fig. 5. Practically all reducing valve stations had to be installed in congested spaces so that the compact design illustrated was used without sacrificing accuracy or steadiness of valve operation. In some cases where terminal steam pressures of 5 lb. or less were required, as for instance to the converters for the hot water heating system in the Treasury Building, pressure reduction was made in two stages.

Sump pits receive drainage from the tunnels and are not connected with the tunnel proper except by a sealed

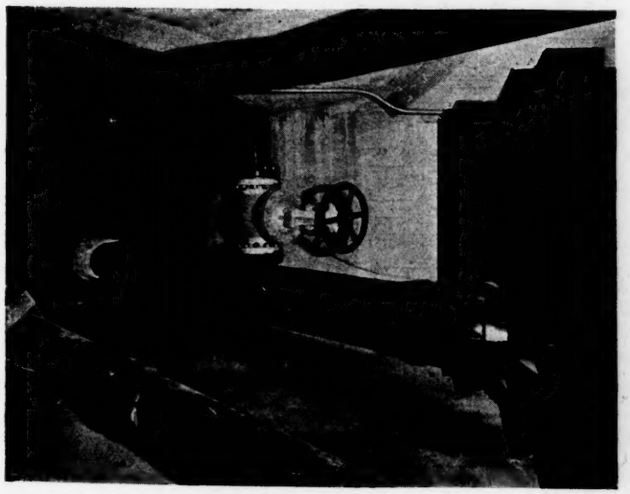


Fig. 4. Corner anchor and branch connection details. Note strap reinforcement on pipe weld.

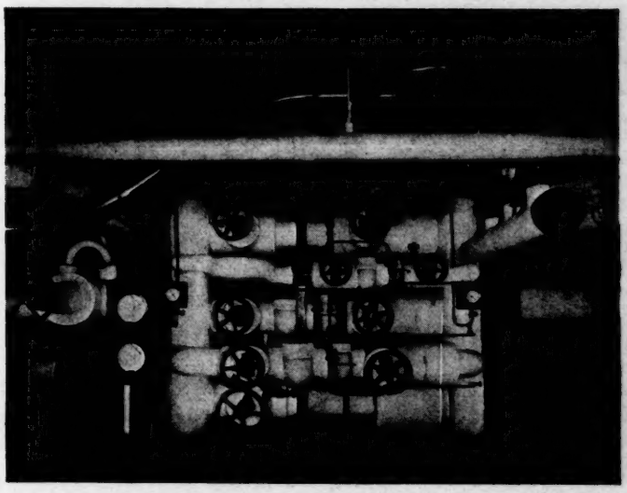


Fig. 5. Pressure reducing valve station in Agriculture Extensible building.

drainage inlet. Sump pumps in all sump draining tunnels are in duplicate and are of the vertical centrifugal type. Wherever the pump motors and starting equipment are exposed to possible inundation, they are of special design to permit continuous operation when submerged.

In general the tunnels are lighted by 50-watt clear lamps in vaporproof globes with guards, spaced not more than 100 ft. apart. In particular they are spaced so that there is a light at all expansion joints, manholes, and exits.

As the tunnels are of great length the lighting supply is taken from several buildings along the route. Some of the circuits are over 2000 ft. in length so that four-wire, three-phase circuits, 120 volts, leg to neutral, are used to reduce voltage drop to a minimum. Separate circuits for providing power for the sump pumps are taken from buildings along the route in a similar manner.

The lighting circuits are controlled by contactors located in the several distribution centers and are operated by pushbuttons placed at convenient points in the tunnels and at all entrances and emergency exits. The pushbutton control switches for adjacent circuits are so arranged that the lights in the section ahead may be turned on and those in the section already traversed turned off.

The lighting was designed to provide enough illumination for general purposes. To provide lighting and portable tool service for maintenance of piping and apparatus, plug receptacles are placed generally at every other light, from which points any part of the tunnel may be reached with a 110 ft. extension cord.

The total cost of the complete distribution system, including such piping and reducing valves as were required in existing buildings, was approximately $1,600,000. The project was in charge of the Office of the Supervising Architect of the Treasury Department, now Procurement Division, Treasury Department, and its engineering staff. Designs for the work were done by United Engineers & Constructors Inc., Philadelphia. United Engineers & Constructors Inc. also supervised the construction work under the direction of the Supervising Architect. The distribution system was built in two sections; the first by Northeastern Piping & Construction Corp., North Tonawanda, N. Y., with the Marocco Construction Co., Baltimore, as sub-contractors for excavation and concrete work, and the second by Peter & A. J. Ellis Inc., with the Standard Piping & Fitting Co., as sub-contractors for piping.

Elevator Shaft Used for Air Conditioning Duct

AN unused elevator shaft in the Federal Reserve Bank Building in Kansas City furnished the means of effecting a large saving in the installation of the first complete summer air conditioning system in a downtown Kansas City office building. The apparatus will condition the remaining 15 floors of the 21-story building, as the space occupied by the bank has already been conditioned.

The elevator shaft will be used as a duct to carry the cool air from the apparatus to the distribution ducts on each floor. At each floor level, inside the shaft, an open grille floor will be erected and upon it a fan unit will be set. The fan will discharge the conditioned air into the main trunk duct which will be hidden behind a false ceiling in the corridor. Branch ducts, similarly concealed, will be run into the various offices.

Thus the shaft will serve three purposes. First, it will eliminate the need of cutting through the reinforced concrete floor slabs for the ducts; second, much ductwork will be eliminated, since the shaft will act as a duct; and, third, it will provide space for the fan units.

A steam jet system of refrigeration located in the top of the building will be used largely because of the lack of space in the basement and also because of the expense of running circulating piping to the roof of the 21-story building where the cooling tower will be located. The steam jet apparatus can be located directly beneath the roof as only the dead weight has to be provided for. Only a small amount of piping and power will then be required to convey the condenser water to the cooling tower. The tower will be about 20 ft. high and 120 ft. long with a capacity of 2400 g.p.m. It will be the largest of the sort in Kansas City used in connection with an air conditioning system.

The steam jet unit will have a refrigerating effect of 300 tons per 24 hr. when the water is cooled to 50°. A total of 112,500 c.f.m. of air or 7500 c.f.m. per floor will be supplied. The total cost of the system, which is being erected by the Clifford H. Carr Company, is estimated to be $60,000. The installation, designed by Walter E. Gillham, is expected to be ready for operation in the early part of June.

The actual saving, which will result from the use of the shaft, is difficult to estimate because of the variable factors involved in cutting the concrete floors for the flues. It is believed, however, that the cost might easily be $8000 to $10,000 more than the $60,000 estimated. It is probable that had this additional cost been added, the air conditioning system would not have been installed at the present time.

Because of the elimination of the flues, the floor area of the building will not be reduced. This will result in a considerable saving because of the high cost of floor space in a building of this type.

Year's Progress in District Heating

As shown by reports gathered from utility companies which offer a district heating service

BALTIMORE: One of the largest department stores installed steam ejector air conditioning equipment consisting of a 300-ton water chilling machine, a 1000-g.p.m. induced draft cooling tower and two 750-g.p.m. pumps to circulate the water through an air washer. About 150 tons of the refrigeration is to take care of the present load with 150 tons reserved for future extensions. About 50,000 c.f.m. delivered by main fan to basement and first floor, with auxiliary fans for recirculating and boosting duct pressures.

A long-established brewery took district steam service when its modernization program began, following legalization of beer. Besides heating the large buildings, steam is used for cooking the wort in 300-bbl. brew kettles, steaming the mash in large tubs, sterilizing bottles, pasteurizing the bottled product, and drying spent grain.

New University Hospital, a 10-story building with 15-story tower, 400-bed capacity, uses the steam service for 92,000 equivalent square feet of radiators and for other uses including water heating, kitchens, and sterilizers. A maximum demand of 23,000 lb. of steam per hour.

DETROIT: Connected one large building—the new Post Office and Federal Building. Additional use of district steam for jet conditioning system is contemplated in addition to the one now served. Company will operate a demonstration installation in one of its plants this summer for benefit of prospective users. Price stiffening in the oil market reduced incentive for customers to convert to use of oil. A 10% temporary reduction in rates put into effect during year.

DULUTH: Added 3000 ft. of pipe to distribution system during summer of 1933 to accomplish dual feed and to loop ends of lines. Added 50% to past year's business. Extension of lines to residential districts rumored but not confirmed.

IOWA: Iowa Electric Light and Power Company reports no additions to plant equipment except that two extra stages were added to one turbine to improve its efficiency. In some towns, especially those where natural gas companies are pushing use of gas, company has added some new customers to steam service. Reports success at meeting the natural gas competition. Construction confined largely to maintenance and replacement. At Perry, Iowa, plan to re-lay about 1500 ft. of hot water mains. At Marion lay 1000 ft. of steam main to replace old ones, and 250 ft. of extension to meet competition. Little construction activity at Cedar Rapids.

Company is experimenting with a totalizing differential thermometer for use in hot water lines. Mr. Proescholdt in charge of experiment which at present is in an early stage. Seems possible that with a calibrated orifice and a differential thermometer, a therm rate for sale of hot water heating can be developed for use in this territory.

MILWAUKEE: An experiment in testing hydraulically the condition of the mains was introduced last summer. This consists of subjecting the mains to hydrostatic pressure during the summer off-period with the object of learning where there are weak spots or conditions which need repairs. When these are found they can be repaired under much better conditions than are possible during the operating season when the service must be maintained.

Increased emphasis has been put on customers' utilization work and customers were found more responsive to suggestions for saving themselves money than ever before. Favorable responses were also received to attempts to encourage former customers to reconnect to the service. Restrictions on the operating and selling methods of competitors brought about largely by the new government regulations have had a good effect on the steam business for automatic firing devices cannot now be offered so attractively as heretofore.

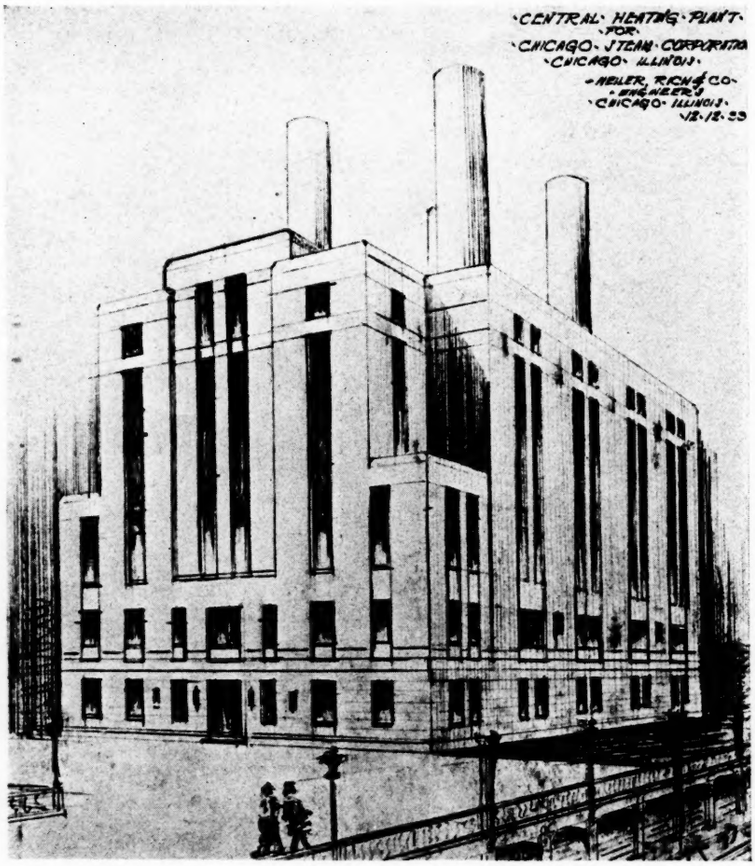
NEW YORK: Steam sales and revenues increased during the year, and both set new record highs. Earned surplus, after payment of preferred and common stock dividends, also increased. Construction work in the generating plants was confined largely to maintenance and repair. Net capital expenditures were held to a minimum but the length of mains and services increased 2300 ft. during the year. The three large Federal buildings now under construction on Manhattan Island will be supplied with district steam service on completion. While the amount of new business obtained was less than in 1932, many important buildings were secured as customers, and especially gratifying was the fact that several former customers who had left the service were induced to return. Steam jet air conditioning enjoyed a good reception and 10 installations using this equipment were secured, with several others expected during the present summer.

PHILADELPHIA: Twenty-eight new customers were added. A new instantaneous system peak of 270,000 lb. per hr. was reached when the record low temperature at Philadelphia was broken in February with a new record low of —11°. The previous system peak was 195,000 lb. per hr. Part of the increase in peak

(Continued on page 90)

Chicago Tunnel Development—an Unusual District Heating Plan

By ROGER D. DeWOLF†



Proposed central heating plant for the Chicago tunnel system. Courtesy Neiler, Rich & Company

ORGANIZED in 1899 as the Illinois Telephone & Telegraph Company, in pursuance to an ordinance passed at that time, the Chicago Tunnel Company under the original and subsequent ordinances became in the course of years one of the world's greatest tunnel systems. Today this system, comprising more than 60 miles of concrete tunnels, underlies practically every street of the famous Loop area of Chicago and, in addition, certain areas to the north and west of the Chicago River.

In July, 1932, a new franchise was granted, perpetual but subject to conditional termination after 1962. This gives the company the right to enlarge its tunnels by making use of an additional 5 ft. below the floor of the present tunnel. The present tunnels are limited by franchise to 7 ft. 6 in. wide by 8 ft. 6 in. high inside. Most of the tunnels are actually 7 ft. 6 in. wide by 6 ft. high, except at crossings, average about 40 ft. below the street surface, are concrete lined, well ventilated, and well drained. With such facilities available for the "conveyance, transportation, transmission" of almost everything except passengers, the Chicago Tunnel Company has an almost ideal set-up for the installation of a system for the transmission of steam to users in an area of exceptional load density.

Those of us who have built and operated steam distribution systems in our larger cities realize vividly the difficulties encountered. Opening up streets congested with surface traffic, sometimes so continuous that work can be done only between midnight and 8 a.m.; relocating gas and water pipes, electrical conduits, sewer laterals, etc., in order to get room for the installation of the steam line; building special pipe connections; making the best of poor facilities for properly draining the condensation from the lines, and taking care of expansion under very adverse conditions —this is merely a brief enumeration of the major difficulties to be overcome, often at almost prohibitive expense.

†Mechanical Engineer, Rochester, N. Y.

With certain of the existing tunnels available, with little change, for the installation of the steam distribution system, and other tunnels which can be readily deepened without any traffic to interfere with the work or obstacles to be moved, installing a steam distribution system in these tunnels is almost as simple as putting steam lines into a power plant—a striking contrast to the difficulties ordinarily encountered in underground construction.

From an operating standpoint, the ability to inspect any portion of the line, any valve, trap, or piece of equipment at any time, and to make repairs before the need becomes acute, not only insures a maximum of service reliability but greatly reduces the cost of such inspection and repairs. Serious leaks, if they should occur, can be repaired in a fraction of the time required when the streets have to be dug up in order to get at the point where failure occurs.

The writer made a detailed survey of approximately 50 out of the 100 blocks in the Loop area. The survey indicated a present estimated yearly consumption of 6.2 billion pounds per year for these 50 blocks; in normal times this would evidently be considerably greater.

It developed in this survey, that there was a surprising number of prospects whose yearly load factor ran better than 40%. Such customers, with the air conditioning load which is now developing so rapidly, added to their existing load, will develop a load factor which will earn them a very attractive rate.

Studies made in developing a preliminary rate system, indicate that for an area such as this, where the load density is very great, a demand rate best meets the requirements; it gives the high load factor customer the advantage to which he is entitled over a low load factor customer, and by spreading the demand charge over seven or eight months, it becomes due during the heavy load period of the year and reduces the summer rates during the off-peak period to merely the consumption charge.

The engineering design in connection with the distribution system and generating plant has been carried out by Neiler, Rich & Company, with the cooperation of the writer. Particular attention has been given to reliability in both the distribution system and the generating plant; to the reduction of distribution system losses, and the proportioning and design of individual boiler units to insure a high availability factor, and to maintain high efficiency under all load conditions likely to be encountered.

The plant, located adjacent to the Loop area, will be connected to the distribution system by two 20-in. mains arranged to loop into the area. It is planned to use an all-welded construction, with the valve and expansion joint bodies welded into the line. The lines may be carried on rollers or slides, or suspended. Connections to customers may be taken off at the anchor points of the main line, or where the connections are not anchored for 20 ft. from the main line, they may be taken off at any point, since lateral movement of the connection is not limited as is the case in underground construction. Proper drip points with traps can be located wherever advisable. The main system in the Loop will form an interconnected grid with valves at street crossings, so located as to permit shutting down a given line with a minimum of inconvenience to customers.

With a grid system of this type, sub-headers can be run through customers' basements in a given block and connected to separate distribution mains at each end of the block so that service can be maintained even though one of the distribution mains should be down for repairs.

A special study was made of the probable temperature rise in the tunnel due to heat loss from the lines. The tunnels now have a practically constant temperature, winter or summer, of approximately 55°, and it is believed that with the pipes efficiently insulated, that even in a section of tunnel closed off so as to prevent any circulation of air, the temperature will not rise above 110°. Approximately 3 in. to 4 in. of insulation applied in two layers appear to give the best results economically.

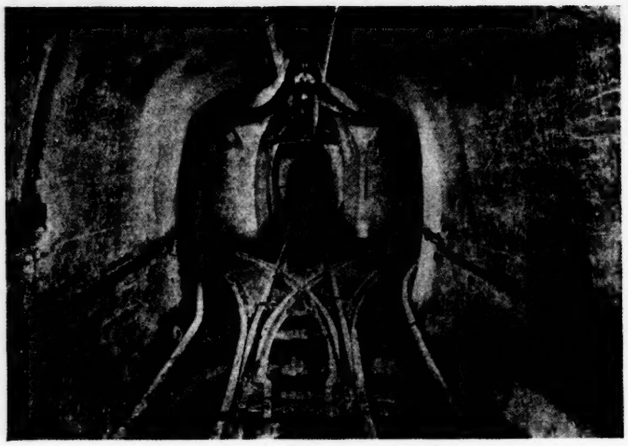
With electricity available in the tunnel, portable blowers, motor-operated, can be quickly taken to any desired point where repair work is under way, to provide special ventilation, and motor-operated equipment will facilitate repairs in many cases.

To meet the very large maximum hour demand without installing unduly large mains, it is proposed to allow for a very generous pressure drop in the lines; it is planned to generate at 350 lb. to 400 lb. at the plant, and install pressure reducing stations for large individual customers, or for groups of customers, so as to deliver steam to them at a constant pressure irrespective of the varying pressure at the customer's service connection due to the varying pressure drop in the main line. In the design of these pressure reducing stations, continuity of operation, safety, ease of repair or replacement, and adjustability to meet the customer's requirements, will be the deciding factors.

Steam flow meters will naturally be used for all large customers. Small heating customers probably will be billed on some form of block rate and metered by means of condensation meters.

The generating plant will be designed to burn Southern Illinois or Indiana coal smokelessly and efficiently. Preliminary designs and estimates indicate an efficiency of 85% or better. The individual boiler units will have a generating capacity of approximately 250,000 lb. to 300,000 lb. per hr. for the first two units installed, with the additional units being probably of 400,000 lb. to 500,000 lb. capacity. By thus providing a limited number of smaller sized units, more efficient operation will be maintained during the off-peak periods of the year. All units will have an emergency capacity for from 2 hr. to 4 hr. considerably in excess of the rated capacity.

Sufficient non-condensing generating capacity will be installed to drive all the auxiliary plant equipment; a heat balance study indicates that sufficient exhaust steam will be supplied to heat the feed water except during periods of maximum load when possibly 6% of live steam will be required in addition. A small amount will be wasted to the atmosphere during ex-



View in the Chicago Tunnel

tremely low load periods and on summer Sundays.

The feed water will be taken from the Chicago River at a point close enough to the lake to be free from sewerage—practically pure lake water. It will be treated by hot process softeners, and filtered before being delivered to the boilers.

In general, simplicity and reliability in operation will be the controlling factors in the design, thus insuring a high availability factor for the individual boiler units and for the plant.

It is planned to install in the plant pressure reducing valves on the main outgoing steam lines. Recording pressure gauges actuated from distant points on the distribution system will indicate to the plant operator what the pressure conditions are on the system. The pressure reducing valves may then be set either manually or automatically to maintain the pressure at the distant points on the system at such pressure as may be desired.

It is believed advisable to install superheaters of sufficient capacity so that the steam leaving the plant will carry approximately 50° of superheat to reduce condensation in the lines, make water hammer less likely to occur, and to insure the delivery of dry or slightly superheated steam to the customers under all normal conditions of operation.

These facilities of the Chicago Tunnel Company place it in a position to render a great steam distribution service to Chicago, in addition to the present service as a transportation company. Changes in the past 20 years in the transportation demands of the district have resulted in its being possible today to assign certain tunnels in certain streets to be used for steam mains, and certain other tunnels to be used for general transportation purposes; while in still other cases, deepening the tunnel will permit it to be used for both purposes simultaneously.

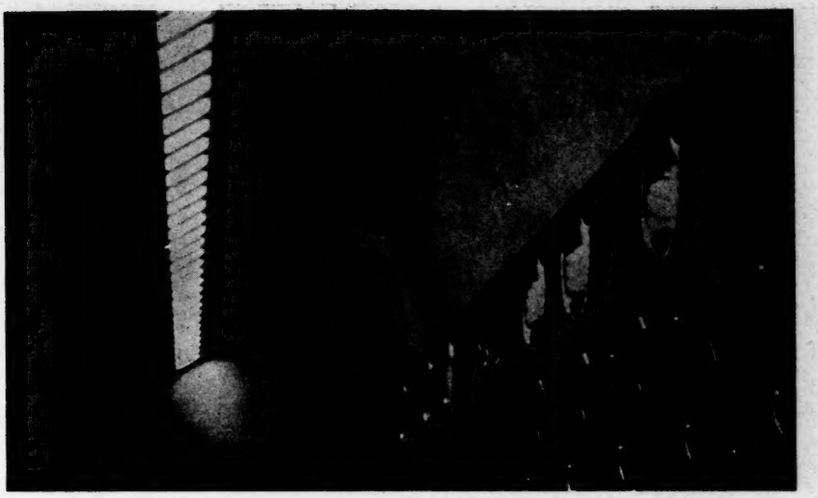
Decade of 1921-30 Warmer than Previous Years

THE 1921-1930 decade saw the United States accumulating a temperature credit. The temperature, pressure, and precipitation records for those years the world over have just been issued by the Smithsonian Institution as a continuation of its World Weather Records, issued in 1927, which gave these data for many years previous to 1920.

These records have some interesting indications, although they have not been subjected to and might not be supported by statistical analysis. For example, nearly every station in the United States for which H. Helm Clayton, editor of the *World Weather Records*, was able to obtain data, showed a higher mean average temperature for the decade than the mean average temperature for all the previous years during which observations had been taken.

A few comparative temperature records are shown in the table below.

Albany, N. Y.:		**Detroit, Mich.:**		**Nashville, Tenn.:**		**St. Louis, Mo.:**	
Mean for 110 years,	48°	Mean for 83 years,	48.5°	Mean for 50 years,	59.3°	Mean for 80 years,	56°
Mean for decade,	48.6°	Mean for decade,	49.2°	Mean for decade,	59.6°	Mean for decade,	56.6°
Bismarck, N. D.:		**El Paso, Tex.:**		**New Haven, Conn.:**		**St. Paul, Minn.:**	
Mean for 48 years,	40.7°	Mean for 44 years,	63.2°	Mean for 145 years,	49.6°	Mean for 50 years,	44.1°
Mean for decade,	42.0°	Mean for decade,	63.8°	Mean for decade,	50.4°	Mean for decade,	44.6°
Charleston, S. C.:		**Galveston, Tex.:**		**New York, N. Y.:**		**Salt Lake City, Utah:**	
Mean for 100 years,	65.4°	Mean for 50 years,	69.4°	Mean for 100 years,	51.8°	Mean for 50 years,	51.8°
Mean for decade,	65.9°	Mean for decade,	69.8°	Mean for decade,	52.2°	Mean for decade,	52.4°
Chicago, Ill.:		**Key West, Fla.:**		**Omaha, Nebr.:**		**San Diego, Calif.:**	
Mean for 50 years,	50.2°	Mean for 90 years,	76.8°	Mean for 50 years,	50.5°	Mean for 80 years,	60.6°
Mean for decade,	50.7°	Mean for decade,	77.3°	Mean for decade,	51.8°	Mean for decade,	61.5°
Cincinnati, Ohio:		**Little Rock, Ark.:**		**Phoenix, Ariz.:**		**San Francisco, Calif.:**	
Mean for 50 years,	55.4°	Mean for 43 years,	61.7°	Mean for 50 years,	69.2°	Mean for 75 years,	55°
Mean for decade,	56.1°	Mean for decade,	62.4°	Mean for decade,	70.3°	Mean for decade,	56.3°
Denver, Co'o.:		**Mobile, Ala.:**		**Portland, Ore.:**		**Spokane, Wash.:**	
Mean for 50 years	49.9°	Mean for 50 years,	66.5°	Mean for 50 years,	52.5°	Mean for 42 years,	47.7°
Mean for decade,	50.2°	Mean for decade,	67.4°	Mean for decade,	53.4°	Mean for decade,	48.4°



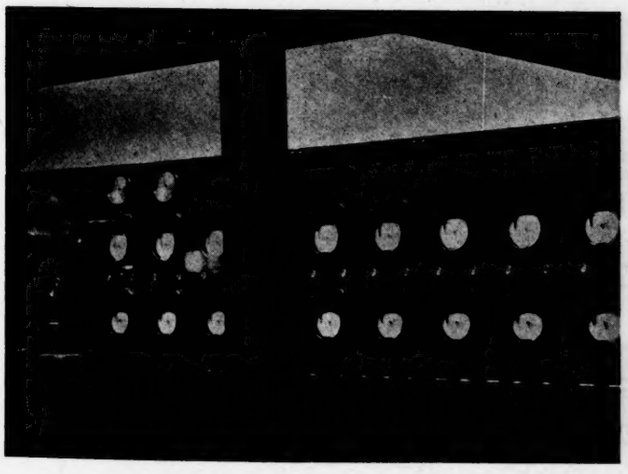
General arrangement of illumination for front of instrument board and control room, with diffusing glass in light trough at ceiling.

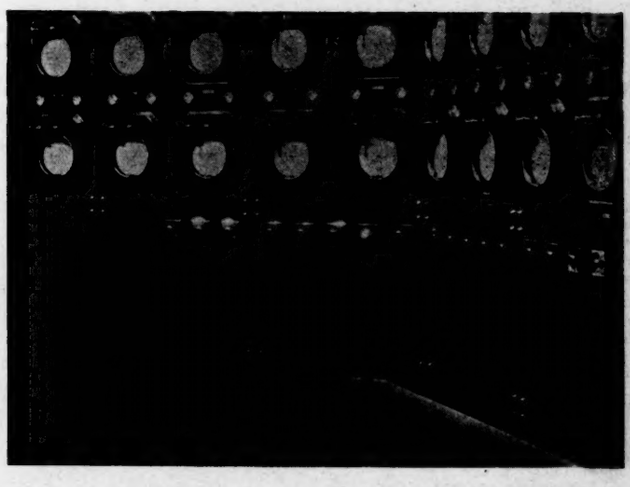
Modern, Automatic Equipment Completely Controls Air Conditions in Rockefeller Center

The unusual views shown on these pages are a detailed record of a trip through Rockefeller Center. Photographers usually pass by controls and instruments for more spectacular apparatus, and the rarity of pictures of this vitally necessary equipment gives value to these illustrations of well-thought-out details of design. They have added interest in that the heating and air conditioning systems in this huge project have what is probably the largest, most complete and modern collection of instruments and controls ever used in a single group of commercial buildings.

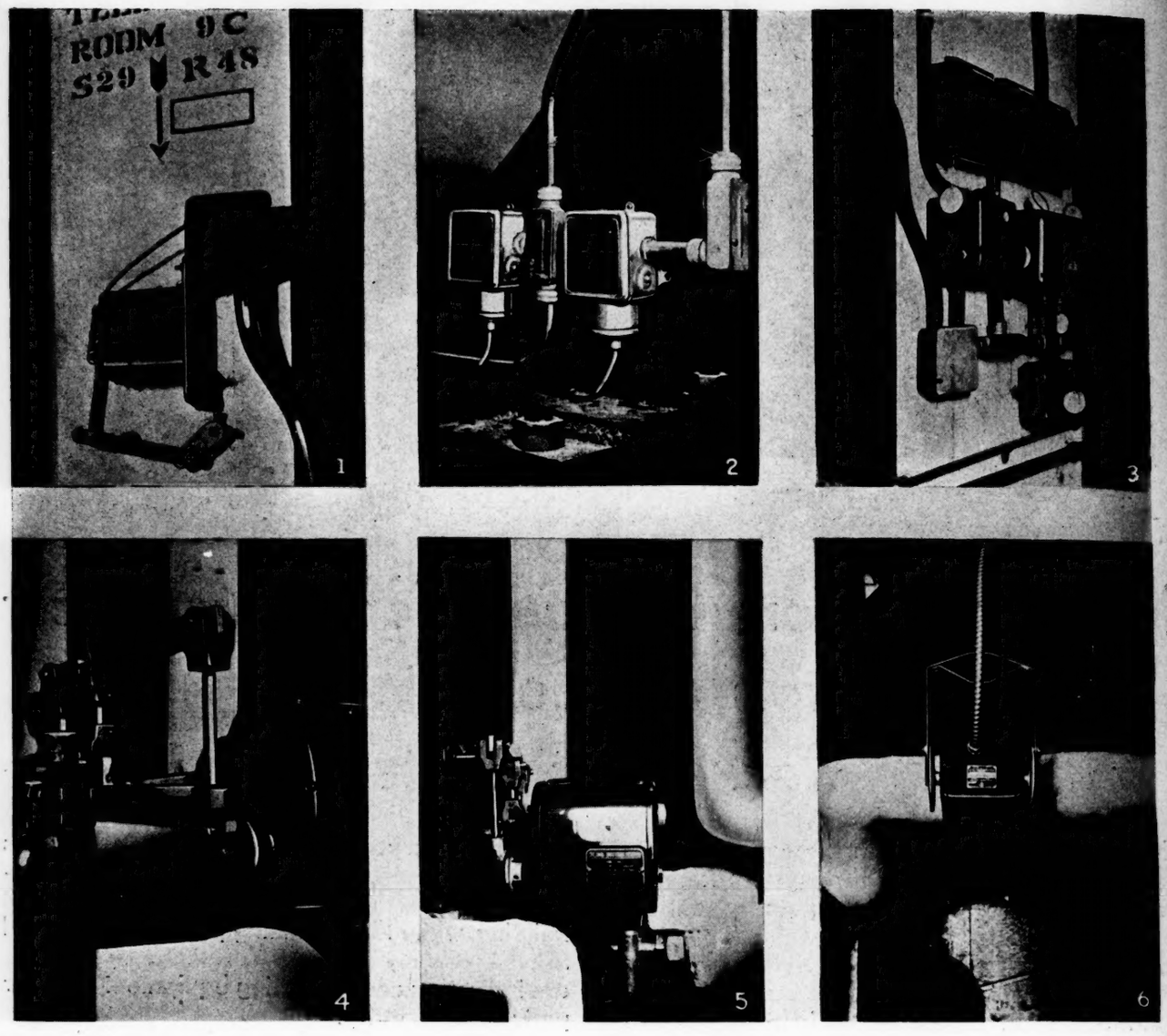
On this and on pages 34 and 35 are shown views of the air conditioning control room of the National Broadcasting Company studios in the RCA Building, while the remaining pages are devoted to other equally interesting applications of modern indicating and regulating equipment in other parts of Radio City.

We appreciate and acknowledge the assistance of the following companies in collecting these photographs: C. A. Dunham Company, Johnson Service Company, Minneapolis-Honeywell Regulator Company, Powers Regulator Company.

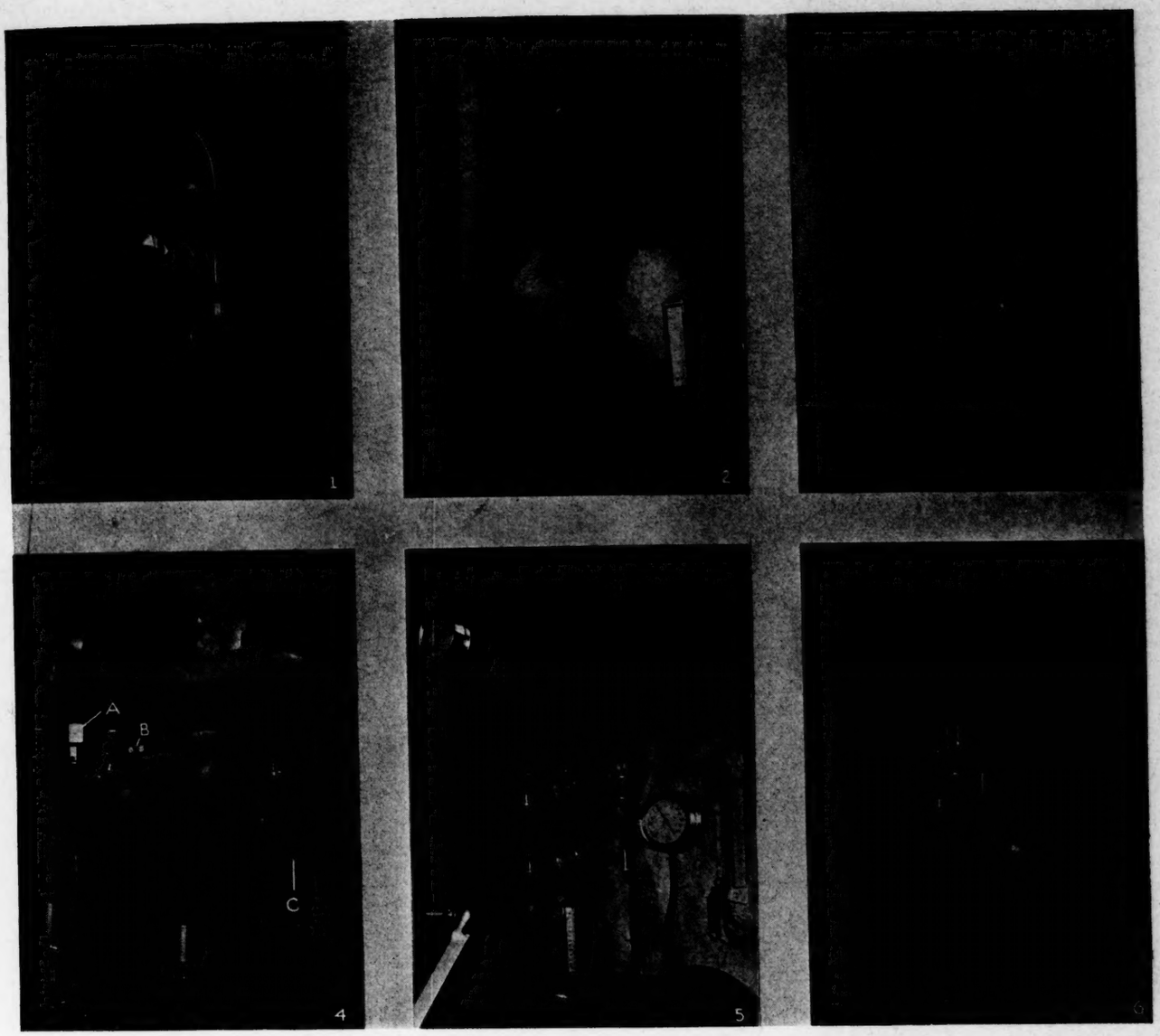




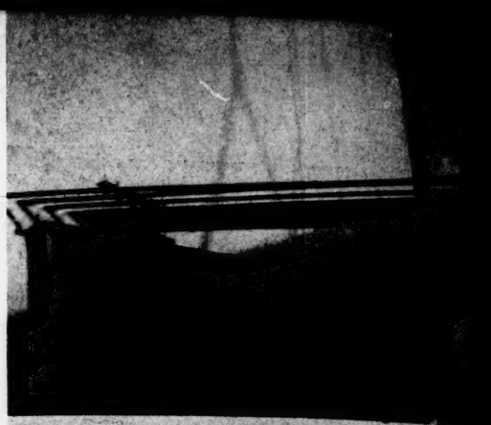
(Left) Portion of instrument board from glass enclosure where public views the control room. (Right) Left section of instrument control panel.



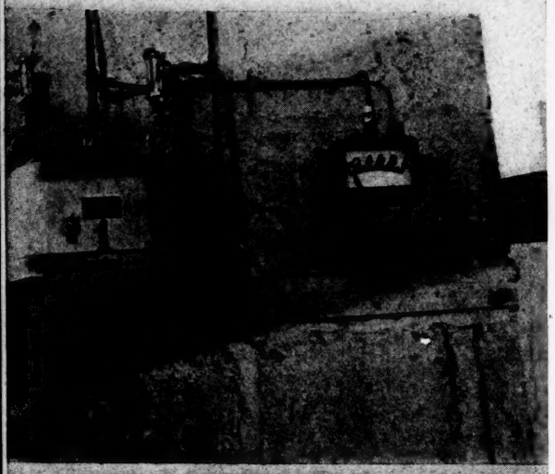
(1) Damper motor in air conditioning equipment room, N.B.C. Studios, R.C.A. building. This controls the conditioned air supply damper according to the demand of the thermostat. (2) Thermostats on the evaporator, steam jet refrigerating system, French building. The thermostat to the right operates the sequence motor for the automatic booster unit, while the other controls the steam supply when the water temperature in the evaporator gets too low, thus avoiding freezing. (3) Power switches and sequence motor controlling operation of automatic booster, steam jet system, French building. (4) Motorized pilot valve controlling water supply to hydraulically-operated vapor valve, steam jet system. (5) Another view of the motorized pilot valve. (6) Motorized valve in the foreground, with thermostat in the back, controlling steam supply to reheater, air conditioning system, 60th floor, R.C.A. building.

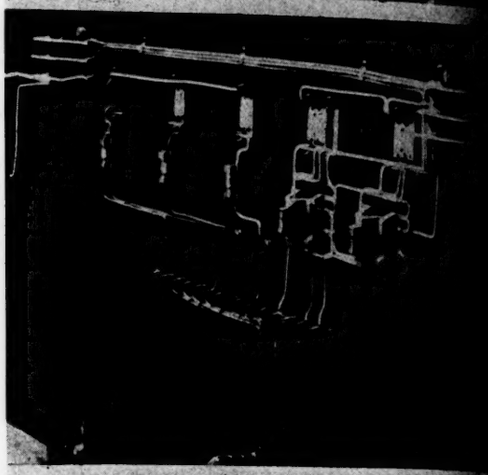


(1) Close-up of temperature controller in conditioned air supply duct, for preventing over-run and under-run of temperatures, Center Theater. (2) Two of the regulators, a close-up of one of which was shown in the preceding view. (3) Controls in the supply duct of the steam jet conditioning system, British Empire Building. The instruments at the bottom are the sub-master controls, the regulator at the center is the static pressure control, and the top instrument regulates humidity. (4) A, B, and C are the diaphragm valve, thermostat, and indicator in the heat economizers in the British Empire Building to control the amount of heat extracted from the condensate. (5) Wet-bulb control on the air conditioning system in the Music Hall. There are three of these units, the one illustrated supplying almost 81,000 c.f.m. of conditioned air. (6) Sub-master remote-adjusted temperature regulator located in return air duct and controlled from the master control board. A number of these are found in the Center and Music Hall Theaters.

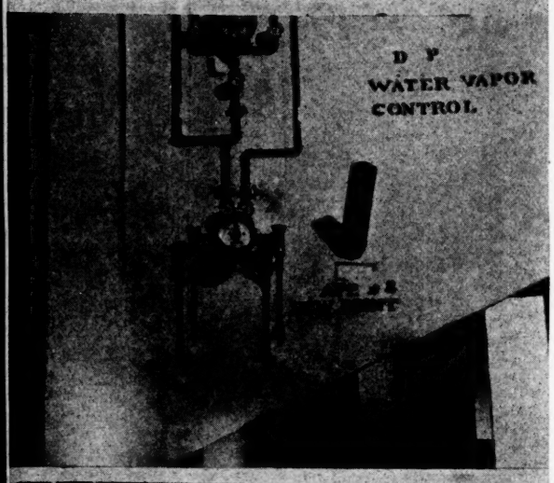


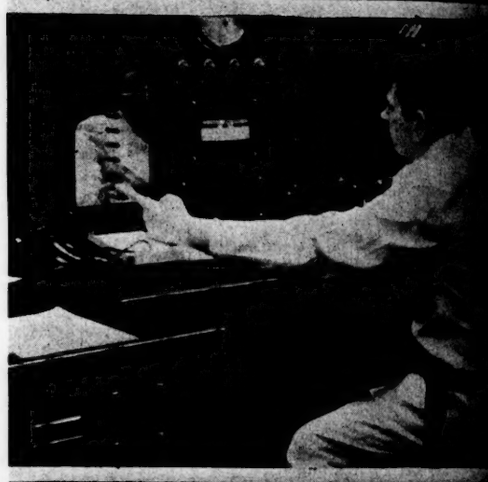
(Left) Close-up of recorders over the operator's desk. (Right) Control piping passing through wall of control room. Each line leads to a pneumatic damper control valve.



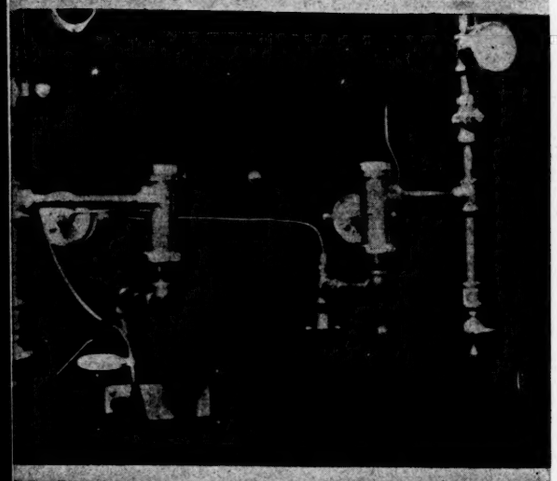


(Left) The instrument at the left maintains a constant static pressure in the plenum chamber. A main damper, placed at the fan discharge, automatically closes and opens to meet the air requirements of the many rooms. (Right) Switches which cut the lamps off when the plant is shut down after hours.





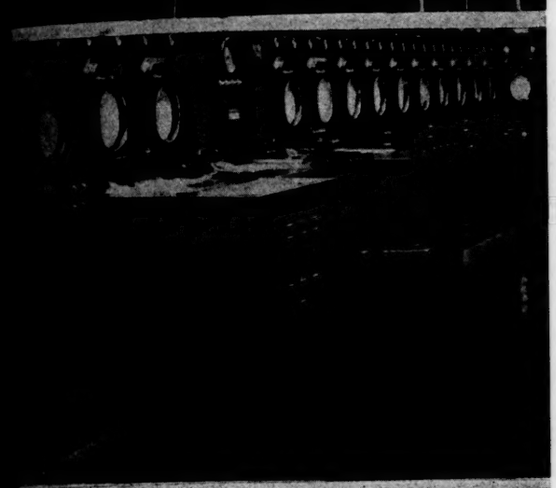
(Left) Control piping to plenum chamber main damper is connected to the side of main duct. The automatic thermostat and thermometer are shown. (Right) By manipulating the switches on the panel, the operator sees the temperature at a remote point indicated on the center instrument.



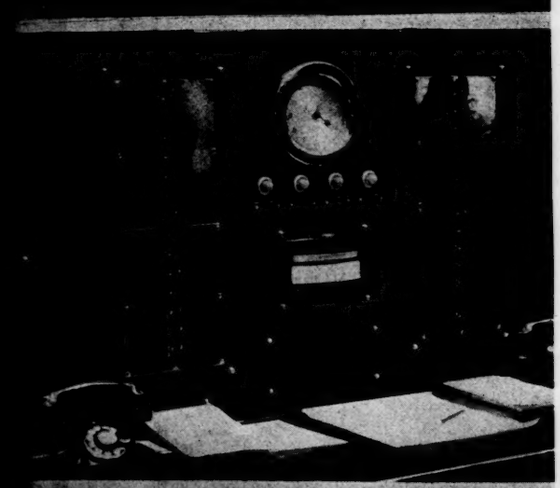
(Left) Connections of the temperature recorder and controller are shown. The large line at left supplies air pressure to the control. At the right the pneumatic control piping is shown. (Right) Rear of board, showing arrangement of electric wiring to the signal bulls' eyes.

(Left) Outside the control instrument room, for the benefit of visitors, is located the sample cut-out, showing construction used in making the ducts noiseless. (Right) Back of a recorder with three separate thermometers in one case, recording three different temperatures on the chart.

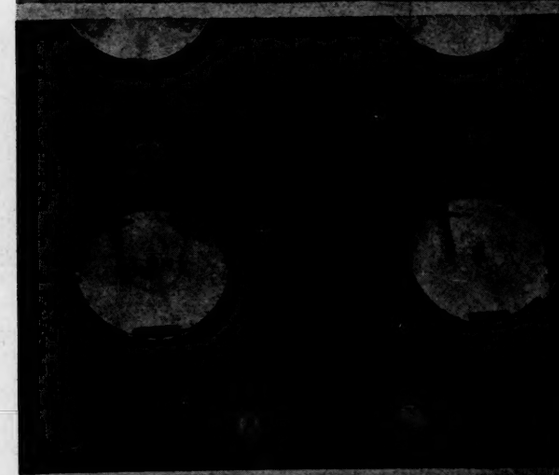
(Left) Piping back of instrument board. The small flexible tubing grouped together leads to the recording thermometers. In some cases these lines are over 300 ft. long, the distance between the thermometer and the sensitive bulb. (Right) Rear section of the electric clock showing how connections are made.



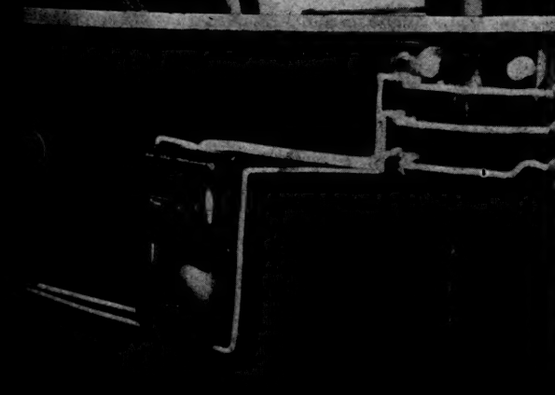
(Left) The "logging" desk is located in the center of the control instrument board. Recording charts are filed in the desk drawers. (Right) Double wall electric outlets furnish current to actuate the telechron movement of the recorders.



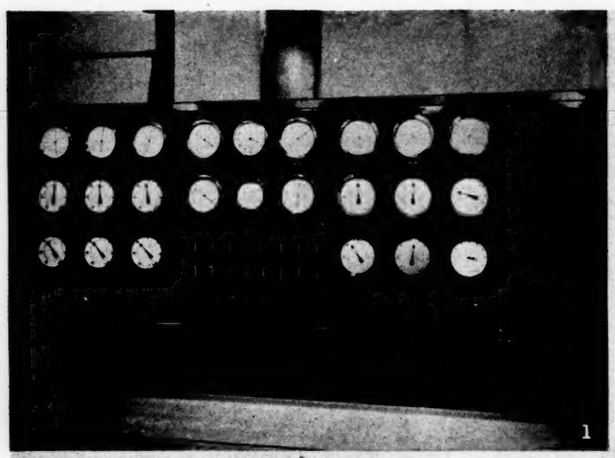
(Left) Center of instrument board showing indicating thermometer with on and off switch for each temperature on plates to the left and right of the thermometer. (Right) Ample illumination and space for inspection and repairs are provided back of the instrument control board.

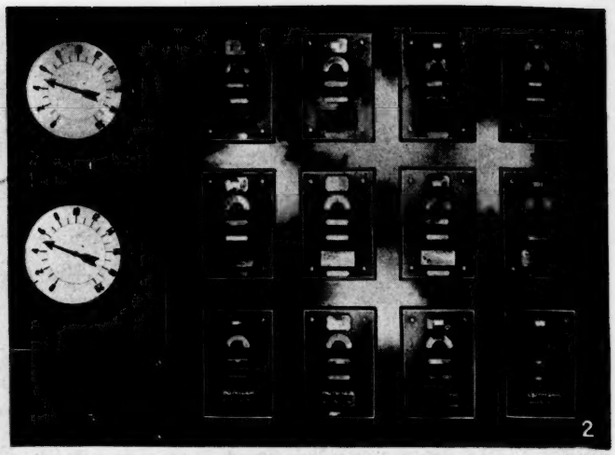


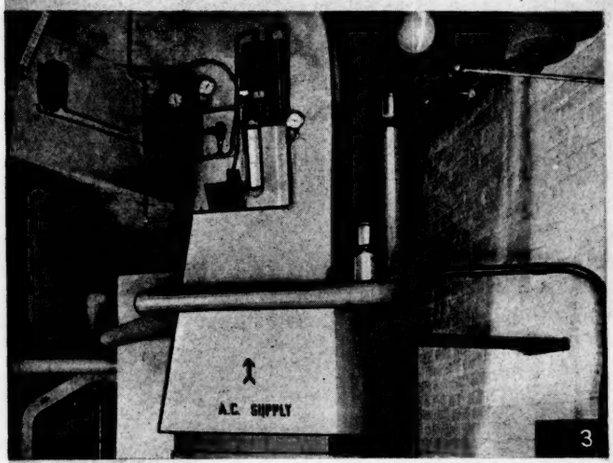
(Left) Neat and systematic installation of the ¼-in. pneumatic brass piping. (Right) Close-up of two temperature recorders. The two small gauges indicate the air pressure in the control piping. From the relative pressures the operator can tell the position of the distantly-located damper.

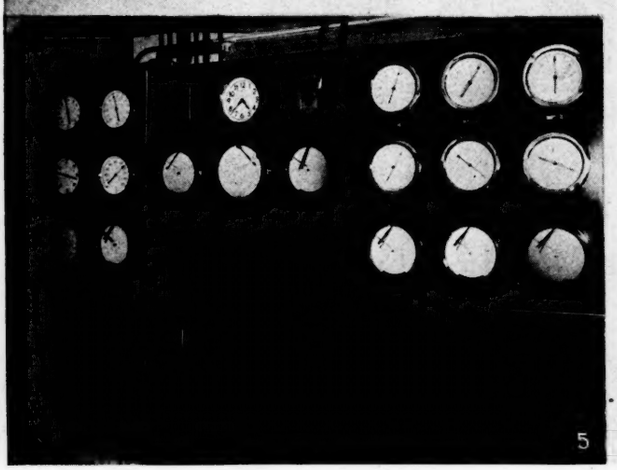


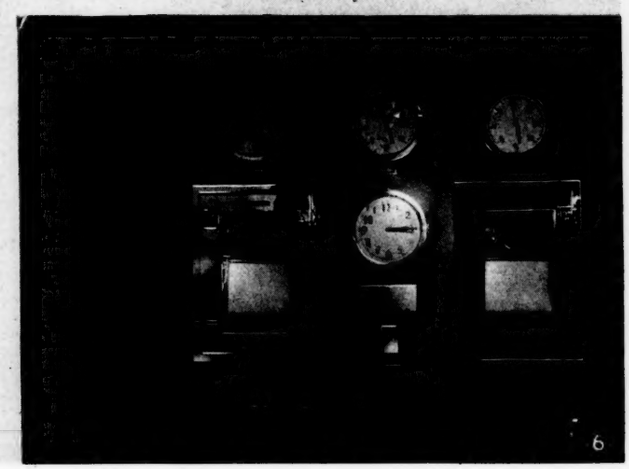
(Left) When a fan stops accidentally, this alarm bell at the rear of the board rings. A light also goes on at the front of the board. (Right) Rear view of recording control thermostat. The two large center fittings are air filters to prevent dirt getting in the control mechanism.











(1) Control and instrument board, heating system, R.C.A. building. The indicating gauges show the pressure or vacuum in the piping to the 11 heating zones and in the indirect heaters, hot water heaters, steam service, etc. The panel at the right has the switches and indicators for changing the various zones from manual to automatic control, and vice versa, and each panel also indicates variations of the average air temperature in the zone from the thermostat setting. (2) Close-up of the switches and indicators in the right panel of the preceding view. (3) Remote or adjustable thermostat in conditioned air supply to Sunken Plaza shops. As the return air temperature changes, this device compensates for it and thus keeps the system in close control. (4) Three of the sub-master or booster controls, in the Center Theater. (5) Control and indicating board for the heating system and air conditioning plant, British Empire building. (6) Master control board for air conditioning system in the Center Theater.

Heating and Ventilating

MODERNIZING

A monthly section for promoting the interests of engineers and contractors in the modernizing and renovizing of heating, ventilating, and air conditioning plants in buildings.

STEAM JET COOLING EQUIPMENT MODERNIZES COMMERCIAL BUILDINGS 38

As summer approaches, stores, restaurants, and theaters are excellent prospects for modern conditioning systems. Some examples.

COOLING UNITS MODERNIZE CHICAGO TRIBUNE TOWER 40

Nearly 400 unit coolers now being installed bring the architecturally-famed Tribune office building up-to-date.

WHAT WILL I USE FOR MONEY? Part 2—The Owner Who Can Borrow 41

The building owner who desires to modernize can usually do so. This article discusses the case of the owner whose credit is good with financing companies or banks.

HOW AN ENGINEER LOOKS AT TODAY'S MODERNIZING POSSIBILITIES 43

Why the professional engineer should prepare plans for proposed modernizing of a heating or ventilating plant.

HOLC TO ENCOURAGE MODERNIZING 43

Amendment to the Home Owners Loan Act makes additional funds available for modernization.

SURVEY OF 25 CITIES DISCLOSES LARGE MARKET FOR HEATING PLANTS 44

Summary of half of the Real Property Inventory shows low extent of saturation of heating market.

MORTGAGE LOANS FOR MODERNIZING INCREASE 45

DEFINITIONS OF MODERNIZING, REMODELING, REPAIRING 45

MODERNIZING BY ZONING AND ZONE CONTROL 46

Because of better temperature regulation and fuel saving, zoning is attractive to building owners as a profitable method of modernizing.

MODERNIZING PLAN GOES TO CONGRESS 48

A summing up of the proposals made by the Federal Government to encourage rehabilitation of existing buildings.

Steam Jet Cooling Equipment Modernizes Commercial Buildings

STEAM jet refrigeration offers a good opening for modernizing. Not only is its use fairly new, consequently still novel and interest-provoking, but in the larger sizes it has attractions from the standpoint of first cost. Moreover, it can be readily adapted wherever there is a supply of steam and water. Air conditioning and cooling of the drinking water supply are two of the typical applications of this method of refrigeration.

One of the reasons why the steam jet is attractive to engineers and contractors for modernizing work lies in the fact that in some of the recent large buildings space has been reserved for installing refrigerating equipment for air conditioning while in other cases the compactness of the steam jet permits finding space for getting it in. Buildings using central fan and duct heating plants in which air washers were placed without attaching refrigeration equipment are common. These are the places where an opportunity to add refrigeration equipment of this kind is most likely to be found.

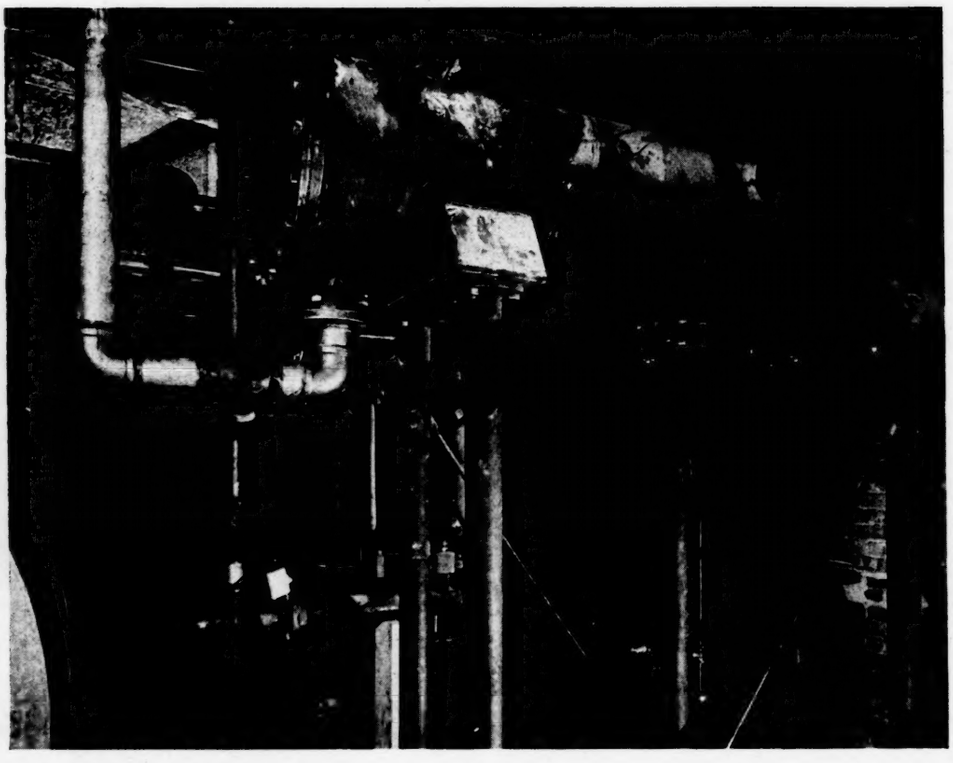
Air cooling and water cooling are live subjects at present. Air conditioning has had the benefit of so much promotion that there is undoubted interest in it, and when it is recalled that air cooling in the minds of many people is really air conditioning, there is an opportunity for installing refrigeration equipment in many large buildings whose owners would not have considered it only a few years ago.

Descriptions of the apparatus available and the theory of its operation have already appeared in HEATING AND VENTILATING (see February, 1933; November, 1933). Steam pressures down to as low as 2½ lb. can be used, and equipment up to 400 tons in one unit can be supplied. Technical information is readily available on request, steam and water quantities can be easily determined, and estimates of operating cost based on them can be made up. The labor involved in the installation is not excessive. Changeovers and connections can be easily and quickly made without disrupting the operation of the present plant. These are all important points which go to provide an inviting set-up for looking for modernizing work with steam jet equipment.

Upwards of 3500 tons capacity of steam jet refrigerating equipment is reported in buildings for air conditioning purposes, while considerable amounts are used for cooling water. These installations range from 300-ton units down to two tons and operate on steam pressures from as high as 200-lb. down to 10-lb. gauge. The estimated value of this equipment is of the order of $250,000. From this it can be seen not only that steam jet equipment is finding ready acceptance but that already it is a dollar volume proposition.

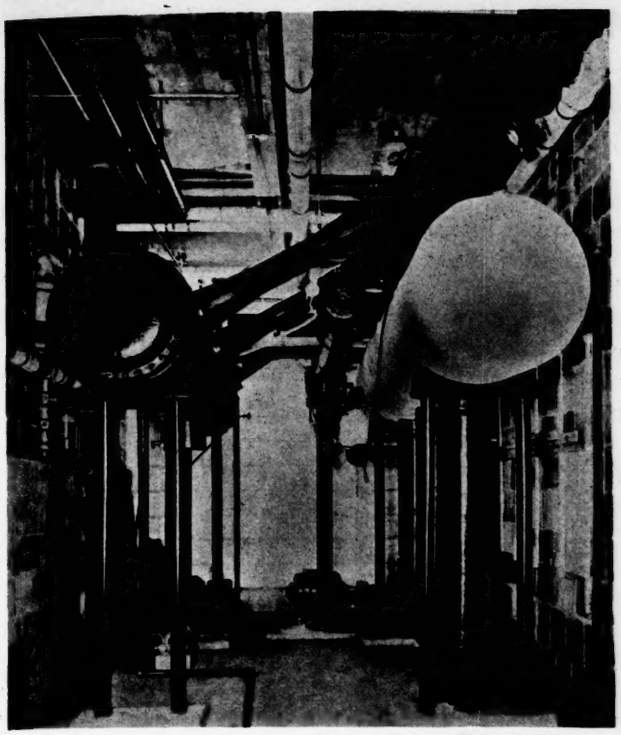
By no means all of the installations have been on modernizing jobs, but it is finding its way into this type of work in increasing amounts. It is a line of action well worth examining for its modernizing possibilities. A few examples where it has been used in existing buildings will serve to show not only that progress is being made but may bring to mind similar situations to be attacked.

The large Paradise Restaurant in New York has a dining room with a seating capacity of 500 and was



40-ton steam jet refrigerating machine in an existing building. View shows installation nearing completion in the New Steuben Tavern, seating 500 persons and occupying five floors at 42nd Street and Broadway, New York. Machine operates on district steam.

American Radiator & Standard Sanitary Corp.



Foster-Wheeler Co.

In the Paradise Restaurant, New York, steam jet refrigeration modernized an existing ventilation system.

formerly ventilated by a cased fan and air washer located in a machine room above the restaurant. City water was supplied to the washer which was thus useful for cleaning and humidification. Attempts to use it for air cooling were not successful, as would be expected, for the humidity rose to uncomfortable levels. The owners accordingly were favorably disposed toward modernizing. Steam jet equipment supplied by district steam was installed in the basement. Water, cooled to approximately 50°, is pumped to the old washer. Duct changes were made in both the supply and return lines. Now the dining room can be cooled as much as 20° if desired.

In the case of the I. J. Fox Building in New York, steam jet refrigeration equipment has been put in the basement and supplies cold water to cool the air on all eight floors of the building. Air supply is drawn from an outside duct on the rear wall. Fin-type room coolers are located immediately behind large wall grilles. Low exhaust grilles on all floors handle outgoing air, exhausted by a roof fan through a large riser duct with the necessary branches.

In New Orleans a multistory office building, the Trianon, was also modernized with a steam jet used to furnish refrigeration. Other examples are the Steuben Tavern, approaching completion of an extensive remodeling at Times Square in New York; the Cities Service Building, one of the highest buildings in New York; the Johns-Manville administrative offices, and several others.

Another notable example, and one where the equipment is relatively small, is the Trans-Lux Theater in New York. In this case a finned coil type of cooler is used with a central system. An unusual feature is that a shell and tube exchanger located in the basement receives cooled water from the steam jet equipment and cools the drinking water which is passed through the exchanger and led to a drinking fountain in the theater lobby on the floor above.

One of the most striking examples of modernizing where a steam jet is used to furnish the cooling is the Tribune Tower in Chicago. Here cooled water is supplied to nearly 400 room-type floor-mounted conditioning units located throughout the building.

The question of cooling water for steam jet equipment is now being actively attacked. In some cases it is being fed into the service hot water lines after being used for condensing purposes. In other cases cooling towers are being used. These, in themselves, offer an attractive modernizing job.

When the Cities Service Building was completed space was left for refrigeration machinery. Photograph shows district-steam operated jet refrigeration equipment now completed.

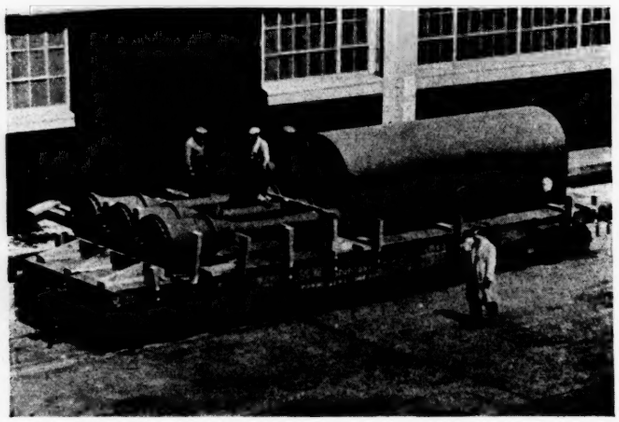
Westinghouse Elec. & Mfg. Co.

Cooling Units Modernize Chicago Tribune Tower

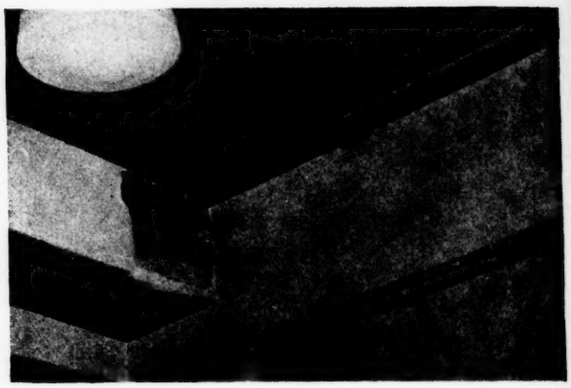
Complete air conditioning without costly alterations or utilization of rentable space is being installed in the famed Chicago Tribune Tower. 387 unit air conditioners will replace radiators in the main tower, while five duct systems will supply the lower floors with conditioned air. Kroeschell Engineering Company, Chicago, is the installer.

Photos by J. A. Masek

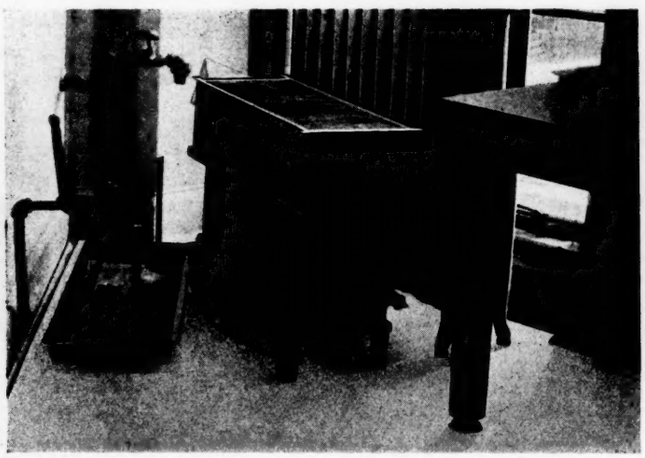
The three copper lines coming from the left supply and return the cold water for several conditioning units on the 26th floor. Copper tubing with streamline fittings sweated in place are used throughout.



Water for the individual units will be chilled in the basement by a steam jet plant of 600 tons of refrigeration capacity. Above is shown one of 10 carloads of parts for the steam jet plant. On the car are seen three of the six steam vacuum jets, while to the right is evaporator tank.



In running the pipe for the unit air conditioners, the concrete in some places had to be removed and holes cut in the steel beams, as shown above.



(Left) The old cast-iron radiator has been removed with the steam supply valve and return trap piped for the copper extended surface radiator within the casing of the conditioning unit. On the floor the unit frame is fastened in place. The two copper pipes coming out of the floor are the cold water supply and return. The center opening is for the condensate drain. (Right) Looking toward the ceiling below one of the unit conditioners. These pipes lead to the floor above and will be covered when the work is completed.

WHAT WILL I USE FOR MONEY?

nearly every case and the success of the engineer or contractor who goes in for modernizing work hinges on his ability to furnish a satisfactory answer. The question of finance is vital to modernization.

Before any modernizing job can actually go ahead the building owner must be able to pay for it. He, it is, who ultimately furnishes the wherewithal to enable the engineer to collect his fee, the contractor to pay his help and meet the cost of his equipment purchases. All this is so elementary that it seems foolish to repeat it. But the fact is that many a job has failed to materialize because of this one trouble. Everything goes well until the owner raises the question "What will I use for money?" It arises in

This being so, it is also essential that everyone who goes after modernization jobs has a pretty clear idea of just how he can go about furnishing the answer to this persistent question. There are answers—and practical answers—as evidenced by the fact that suitable plans are in everyday use by those who are now engaged in this work. Our present object is to analyze the situation and to outline these plans to such an extent that this application may be understandable.

Part 2—The Owner Who Can Borrow

OWNERS who need help in arranging a satisfactory answer to the "What will I use for money?" question are really of two kinds. There are those who need only a moderate amount of outside help because they have (and are willing to use) private means or property or something of value, other than cash, which they can use to pledge with a lender to induce him to lend them cash. The other group is made up of those who, lacking, or being unwilling to use, some tangible evidence of value to pledge for a loan can offer as security only their intangible assets such as earning power, or their anticipated ability to secure small amounts of cash periodically. The plans available to handle the needs of these two groups are different enough to warrant describing them separately.

Where an owner has something of tangible value which he is willing to pledge for a cash loan he is only slightly different from the owner who has actual cash. Supposedly he could, if he wished, convert his value into cash and then he would be able to proceed without help. Ordinarily, however, he wants to avoid going through the procedure of cashing in and becomes a borrower of cash instead.

The important question in this connection is—Can he find someone to accommodate him with a cash loan for modernizing his heating plant, and if so, who? Others are: What part do engineers and contractors play in this situation, how can these owners be located and identified, and is there enough money available to these owners so that modernizing work is not prevented by its lack? We can look into some of these to learn if the question of "What will I use for money?" really is serious to owners of this kind.

To owners who have real value to pledge as collateral for a cash loan, whole classes of banking and finance institutions are available. If the collateral is readily marketable so that its value can be learned—i.e, prime collateral—he can get a cash loan at almost any lending institution. If he has a going business and good reputation he can get a loan for modernizing his heating plant as readily as he can get a short-time collateral loan for any of his everyday purposes. In other words, there is no evidence at all that a lack of money is holding up modernizing work where there is prime collateral.

Loans on Buildings as Security

This would be fine if everyone who had something of tangible value to pledge against a loan had it in prime and readily cashable form. The fly in the ointment lies in the fact that the one item of value which building owners usually have most of—namely, buildings and real estate—now is not looked on with any favor as a basis for loans. This state of affairs is what is really referred to when statements are made to the effect that money cannot be obtained for modernizing heating plants. A more correct statement is that money is especially hard to borrow when real estate, or improvements on real estate, are offered as the whole security. If a building owner can offer something besides his building or real estate he can get loans for modernizing the same as anyone else.

Another fact which operates to make the building owner play a difficult role as a borrower is that either he has little or no cash income from his building or what he does have is so often already pledged to meet payments on mortgage debts contracted in past years that he can assign nothing out of income to apply against a new loan for modernizing.

Here we have the case of a person who really has something of value and who still cannot arrange for means for modernizing his heating plant, for no one wants to lend on the basis of the security which he has to offer. His plight is sad. There are a number of proposed plans for helping him out both by new systems of mortgage banks and by Government credit.

It is not necessary to go into the details of these, and the practical point is that little or nothing has really been done along these lines to help him out. Most of the proposals looking toward Government assistance for modernizing are aimed at this group of people.

Thus we see that the owners to whom the question "What will I use for money?" is really acute are confined to one particular group of building owners. The hue and cry raised over their plight has been so loud and insistent that the impression can easily be gained that *all* buildings are in this state. This is distinctly not true.

Default Situation Improving

There is no reliable method of estimating the number of distressed owners or of finding the value of their holdings. There is no doubt that many of them need financial help badly and that the buildings in many instances have been let deteriorate to a point where they need very badly not only repairs but modernizing. There is no denying the fact that the number of buildings so involved is large. It is doubtful, though, if they represent at present a large percentage of all the buildings needing to have their heating plants modernized. One reason for this is that the status of this group of owners has changed rapidly in recent months. This change has resulted from several factors.

One factor has been the gradual foreclosure of mortgages covering buildings whose income has fallen beneath the level of their debt charges. These buildings have passed to the ownership of financial institutions who are able to do their own financing and are thus taken out of the borrowing group. Another factor has been the gradually improving general situation which is slowly operating to increase the cash income both of owners and their rented buildings. Another, and notable, influence is the slowly dawning realization on the part of mortgage holders that in many cases they are better off in the long run not to foreclose a defaulted mortgage and thus be compelled to operate or manage the foreclosed property, but to leave it in the hands of present nominal owners and let them operate it. Even more recently some financial institutions in this position are seeing the wisdom of themselves advancing money to the managements with which to carry out modernizing plans and thus permit the defaulted properties actively to compete again in the rental market. All of these developments have helped to make the money-for-modernizing question much more answerable to building owners who only a few months ago had no means of attempting even necessary repairs, much less any modernizing program.

In the case of homeowners this distressed situation has been considerably improved recently by the homeowners loans made available through a Government agency, and the even more recent extension of this plan. This latest provision permits the lending agency to not only help the owner finance his mortgage but permits 10% of the total sum to be used for modernization purposes. This provision, effective within the past 30 days, has not yet got into action to an extent which makes its influence felt but should do so in less than another month.

In view of all these facts it is worth while to inquire just how heating plant modernization is affected by the money question, so far as the group of owners who have something of tangible value to offer as the basis of a loan are concerned. The answer is that while the distressed mortgage situation is still serious enough, this group is really the only one to whom no lending plan is available. Not only does this group now have much less effect than it did even a few months ago but the situation is rapidly improving in general. Here is where a Government plan really could help and there is every reason to believe that something will be done soon to improve the condition of this group still further.

What Engineers and Contractors Can Do

This review gives a good background for considering how the facts of the situation affect engineers and contractors as a group and how they are affected by them.

By and large, the facts show clearly that money for modernizing is available to all but one group of owners of this general kind through agencies with which they are well familiar. If owners are well impressed with the benefit of modernizing their plants they can themselves get money for doing it. What is lacking is an appreciation on their part of the real benefits which will come to them from taking advantage of the improved apparatus and equipment which has appeared recently. Clearly, the job of engineers and contractors is to do their part in making owners conscious of these benefits by drawing attention to them by means of definite proposals which will be worked out and then installed in a way to really benefit the owners. No one else *can* do this job, for no one else has the necessary specialized technical skill and "know how."

Who Can Use Loans

Just as in the case of owners who are able to pay for modernizing without the necessity of a loan, owners of the kind who are able to obtain a collateral loan must be searched for and found. In this case, though, there are few well defined leads. It is hard to know the individual circumstances, but the great majority of commercial offices, factories, specialty stores, restaurants, and similar places fall into the group who can readily command a commercial loan of reasonable amount. Much modernizing is being done in these places and much of it requires some borrowing. This kind of building is the typical place to look for this kind of owner. He *can* be impressed, for others are doing it.

Apartments are perhaps the most typical building of the kind whose owner is in such a position that he cannot attempt modernizing. Until his status improves there is little to be done about him, but this does not mean that every single apartment owner is not worth attention. Neither are the ones not in trouble impossible to find, but effort is required.

Modernizing done on borrowed money is just as desirable to engineers and contractors as any other kind, and in most cases there is no real reason for letting the question of "What will I use for money?" act as a preventive.

How an Engineer Looks at Today's Modernizing Possibilities

By F. H. VALENTINE†

MANY an owner has been hesitant about making the most of modernizing possibilities, not so much from lack of finance as from fear, because of some past experience due to poor planning and failures brought about by lack of knowledge of basic essentials.

During the period of slack business of the past three years, many new materials have appeared. They include new materials with methods for building fabrication, new and more efficient heating equipment and systems, new and better lighting fixtures, and many others—all with the ultimate hope that practical combinations will be found which will enable these new products to find useful applications in buildings for the safety, comfort, and health of the occupants.

All buildings at one time or other fall into disrepair which may be caused by any number of things, all of which depreciate the value of the property, but to go about the restoration of a building without properly visualizing the entire problem is a grave mistake. It becomes a hit or miss solution of the problem. If it hits the trouble, all well and good, but if it fails, it is a further expense as well as a disappointment. In many instances, by competent professional engineering service, the use of present materials together with some new, by careful design and arrangement will recondition a building so that it will be serviceable for many years and result in a material saving in costs.

The advantages of having renovizing work done through the right procedure is entirely summed up in economy. The initial cost may at first appear higher than necessary but the benefit of experience from men who have specialized training in this work cannot be interpreted along the same lines as the untrained labor of the other. Such men who do this work for owners are professional engineers with years of experience and research into the merits of the various materials and methods that will result in efficient solutions of the problems of modernizing any building.

†Consulting Mechanical Engineer, Cleveland.

Building owners, I believe, are coming more to realize that because an alteration or repair to a building is cheap, it is by no means economical, because the curve of upkeep and maintenance will rise above the curve of economy. Therefore, much thought should be given by owners and their advisers to the selection of materials and equipment that is most suitable for modernizing, with careful consideration given the initial costs and results desired. The selection of materials and equipment that will conform to all requirements is not a simple matter and in order to handle the problem properly and successfully, it is essential to have definite unbiased information as to what is needed. This, the architect and professional engineer is able and best informed to give.

Heating is one major service in every building and essential to the use of any such structure, and because heating is a major service, many different systems with equipment are available, all with merits. However, each has its proper application, depending on the type of building, its location, use, and numerous other factors. It should also be borne in mind that the installation of a truly satisfactory heating system requires that real care and study be given to the many factors which combine to make for efficiency in operation as well as long life, and accordingly should not be considered lightly in any building program.

Why should owners modernize today? Because materials and equipment can be purchased and installed now at a cost insuring possibilities of savings. Good materials and equipment have been developed in the last two years with the primary idea of producing economies as well as comfort. In addition to realizing these advantages, it will be creating profitable employment, keeping in step with modern development and helping bring back prosperity, all of which is sufficient even in its generality to warrant any owner giving serious thought and careful investigation to the possibilities of modernizing his property.

HOLC to Encourage Modernizing

AUTHORITY for the Home Owners Loan Corporation to advance cash or exchange bonds in an amount up to $200 million for the rehabilitation, modernizing, and enlargement of homes was included in an amendment to the Home Owners Loan Act, approved April 27. It is expected that this authorization will be made the basis of a plan to encourage modernization work in residences which were in default prior to June 13, 1933. This amendment should not be confused with the so-called "Walker Plan" which has not yet been fully formulated.

This money can be made available under terms and conditions similar to those under which the Home Owners Loan Corporation lends money to distressed properties. Announcement of the details of procedure has not yet been made.

Survey of 25 Cities Discloses Large Market for Heating Plants

RAPID progress is being made by the Bureau of Foreign and Domestic Commerce in compiling the results of the Real Property Inventory. Preliminary returns of 25 cities of the 64 covered show some surprising facts concerning the dwellings in these localities. The returns cover 279,689 dwelling units in 230,091 structures which house 961,679 people.

A large market for central heating plants is indicated by the returns, as approximately 66% of the dwelling units have either no heating apparatus at all or are served by a stove, fireplace, or some other similar device. Less than 2% of the dwellings in some of the southern cities have heating plants. Even in the colder climate of the northern cities, the per cent of residences

TYPE OF HEATING PLANT

City	Warm Air	%	Steam or Vapor	%	Hot Water	%	Heating Stove and Other	%	None	%
Casper, Wyo.	1,110	19.8	525	9.3	362	6.4	3,584	63.8	29	0.5
Columbia, S. C.	1,130	9 3	369	3.0	610	5.0	9,960	82.1	28	0.2
Butte, Mont	1,242	11.6	822	7.7	834	7.8	7,795	72.7	13	0.1
Asheville, N. C.	2,273	18.1	1,782	14.2	1,093	8 7	7,410	58.9	19	0.2
Nashua, N H.	1,433	17.9	1,976	24.8	201	2 5	4,286	53.8	1	0.0
Burlington. Vt.	2,029	30.7	703	10.6	960	13.7	2,878	43.1	26	0.4
Paducah, Ky.	789	8.7	473	5.2	216	2.4	7,452	82 5	34	0.4
Greensboro, N. C.	871	7.2	2,252	18.7	182	1.5	8,728	72 3	20	0.2
Boise, Idaho	1,659	25.6	236	3.6	786	12.1	3,891	58.4	3	0.0
Little Rock, Ark.	72	0 3	276	1.0	86	0 3	27,288	98.1	48	0.2
Wichita Falls, Tex.	69	0.7	225	2.1	12	0.1	10.351	96.5	62	0.6
Hagerstown, Md.	2.595	31.8	1,957	24.0	825	10.1	2,765	34.0	2	0.0
Sioux Falls, S. D.	6,208	67.2	668	7.2	494	5.3	1,859	20.1	5	9.1
Fargo, N. D.	3,491	46.7	1,005	13 4	1.994	26.7	958	1.6	7	0.1
Reno, Nev.	1,646	26.6	965	15 6	244	4.0	3,299	53.3	6	0.0
Frederick, Md.	460	12.2	1,534	40.5	320	8.5	1,464	38.6	1	0.0
Albuquerque, N. M.	2,010	25.7	740	9 5	347	4 4	4,704	60.2	13	0 1
Lincoln, Neb.	14,660	63 1	1,907	8.2	2.107	9.1	4,452	19.2	38	0.1
Pueblo, Colo.	4,115	32.3	821	6.5	333	2.6	7,230	57.6	42	0.3
Phoenix, Ariz.	823	5.7	636	4.4	176	1.2	11,617	87.7	127	0.9
Springfield, Ill.	4,162	25.7	487	3.0	802	5.0	10,647	65.7	40	0 2
Santa Fé, N. M.	132	4.9	236	8.7	44	1.6	2,302	84.6	2	0.1
Shreveport, La.	3	0.0	44	0.2	14	0.1	21,552	98.5	244	1.1
Baton Rouge, La.	19	0 2	60	0.8	338	4.4	6,659	86.6	539	7.0
Decatur, Ill.	10,597	64.6	983	6.0	872	5.3	3,902	23.3	15	0.1
Total	63,598	21.3	21,682	7.3	14,252	4.8	197,033	66.2	1,364	0.4

TYPE OF FUEL

City	Coal	%	Wood	%	Gas	%	Oil	%	Other	%
Casper, Wyo.	2,470	44.0	32	0.6	2,955	52.6	12	0.2	100	1.8
Columbia, S. C.	8.036	66 3	3,801	31.3	10	0.0	81	0 6	76	0.5
Butte, Mont.	7.290	68.0	180	1.7	2,969	27.7	24	0.2	230	2.1
Asheville, N. C.	12,306	97.8	175	1.4	1	0 0	43	0.3	25	0.2
Nashua, N. H.	3,868	48.5	1,179	14.8	42	0 5	1,657	20.8	1,088	13.9
Burlington, Vt.	4,603	69.6	395	6.0	7	0 1	1,160	17.5	395	6.0
Paducah, Ky.	8.829	97.8	55	0.6	1	0.0	11	0.1	7	0.1
Greensboro, N. C.	11.534	95.6	374	3.1	2	0 0	64	0.5	59	0.5
Boise, Idaho	5,781	89.2	366	5.6	5	0 0	54	0.8	263	4.0
Little Rock, Ark.	514	1.9	4,371	35.7	17,156	61.7	13	0.0	28	0.1
Wichita Falls, Tex.	20	0.2	1,400	13.1	9,050	84.4	27	0 3	138	1.3
Hagerstown, Md.	7,902	97.0	16	0.2	8	0.1	207	2 5	6	0.1
Sioux Falls, S. D.	7,882	85.3	101	1.1	725	7.9	473	5.1	46	0.5
Fargo, N. D.	6,441	86.3	41	0.5	4	0.0	938	12.6	14	0.2
Reno, Nev.	3.851	62 2	1,060	17.1	1	0.0	1,173	18.9	41	0.7
Frederick, Md.	3.644	96 3	91	2.4	—	—	38	1.0	4	0.1
Albuquerque, N. M.	5,631	72.0	478	6.1	1,592	20.3	90	1.2	11	0.1
Lincoln, Neb.	16,943	72.9	717	3.1	2,903	12 4	2,371	10.2	140	6.0
Pueblo, Colo.	11,915	93.6	75	0.6	518	4.1	39	0.3	27	0 2
Phoenix, Ariz.	5,022	34.9	6,794	47.2	442	3.1	989	6 9	847	5.9
Springfield, Ill.	9,689	59.8	4,944	30.5	733	4.5	568	3 5	72	0.5
Santa Fé, N. M.	941	34.6	944	34.7	819	30.1	9	0 4	1	0.0
Shreveport, La.	36	0.2	1,372	6.3	20,264	92.6	1	0.0	5	0.0
Baton Rouge, La.	1,738	22.6	1,670	21.7	3,598	46.8	61	0.8	56	0.7
Decatur, Ill.	15,888	96 8	29	0.2	226	1.4	151	0.9	35	0.2
Total	162,744	60.0	30,660	11.2	64,031	23.6	10,254	3.8	3,712	1.4

having central systems is surprisingly small. In Butte, Mont., only 27.2% of the dwellings have heating plants and in Springfield, Ill., the percentage is 34.1. In the average northern city, having a January temperature averaging below 40°, 51% of the residences are without central heating systems. A complete list of the 25 cities with the number and per cent of each type of heating plant is shown on the preceding page.

The returns on fuels show that coal is used in 60% of the heating units, gas in 23.6%, wood in 11.2%, oil in 3.8%, and other fuels, 1.4%. There are wide variations in fuels used in the different cities due to nearness to source of supply and also to severity of climate. In Shreveport, La., 92.6% and in Wichita Falls, Tex., 84.4% of the fuel consumed is gas, while in Asheville, N. C., 97.8% and in Decatur, Ill., 96.8% of the fuel used is coal. It should be noted, however, that less than 4% of the heating in Shreveport and Wichita Falls is by central heating plants. Complete data on types of fuels are shown in the table.

Another interesting feature of the survey is the section relating to the conditions of the dwellings. The classifications were good, need minor repairs, need structural repairs, and unfit for use. The percentages reported are: good, 35.5%; need minor repairs, 44.7%; need structural repairs, 17.3%; unfit for use, 2.5%.

The age of the dwellings was found to vary greatly with the city. Santa Fe reported 21.7% of the residences erected during the past four years and 41% in the last 10 years. On the other hand, Frederick, Md., has 38.1% of the dwellings over 50 years old with less than 12% less than 10 years old.

Mortgage Loans for Modernizing Increase

A SHARP upward swing in the dollar volume of mortgage loans for repairing, remodeling, and building houses is indicated by reports to the United States Building and Loan League.

Figures covering the first quarter of 1934 from building and loan associations in six states show an increase of 132% over the same period of 1933 in the dollar volume of loans in this category.

Compared with 1932 statistics from the same group of associations, the 1934 figures represent an increase of 81%.

"Apparently the chief demand for credit in the construction field is from those who want to repair and modernize homes rather than from those wishing to build new houses," says the report. "There are two likely reasons for this: In the first place, the cost of construction has taken such a big leap that families cannot generally afford to buy new homes, while they still can see their way clear to take on a comparatively small obligation for repairing or modernizing. The average construction loan was $2745 in the first quarter of 1932, and is $1800 in 1934.

"Secondly, the existing vacancies are still marked enough to cause the thoughtful family to hesitate about building a house. Reports from various states as to percentage of their new loans going into construction are another revelation. This percentage is 14 times greater this year than last in the case of one state which stands in the upper half of the list in building and loan resources.

"Many others show the percentage of new construction loans to total loans doubled, when compared with last year's performance. These statistics are evidence of a normally developing demand for renovating and for some new building."

Definitions of Modernizing, Remodeling, Repairing

IT is announced that in connection with planning for Government encouragement of modernization work officials have tentatively recognized that there are really three types of work different enough to permit making a distinction between them. They are as follows:

1—*Repairing:* Consists of work which makes a building more livable.

2—*Remodeling:* Work which requires some basic structural change in the building.

3—*Modernizing:* Is that type of work which results in a building or its equipment being improved beyond its original intent or condition.

Setting up this distinction will no doubt result, in the long run, in much clearer thinking as to just what is meant when the word "modernizing" is used. Up to now there has been a great deal of misuse of the word, and projects which are really nothing more than necessary repairs have often been referred to as modernizing. Strictly speaking, they are nothing of the kind.

Modernizing by Zoning and Zone Control

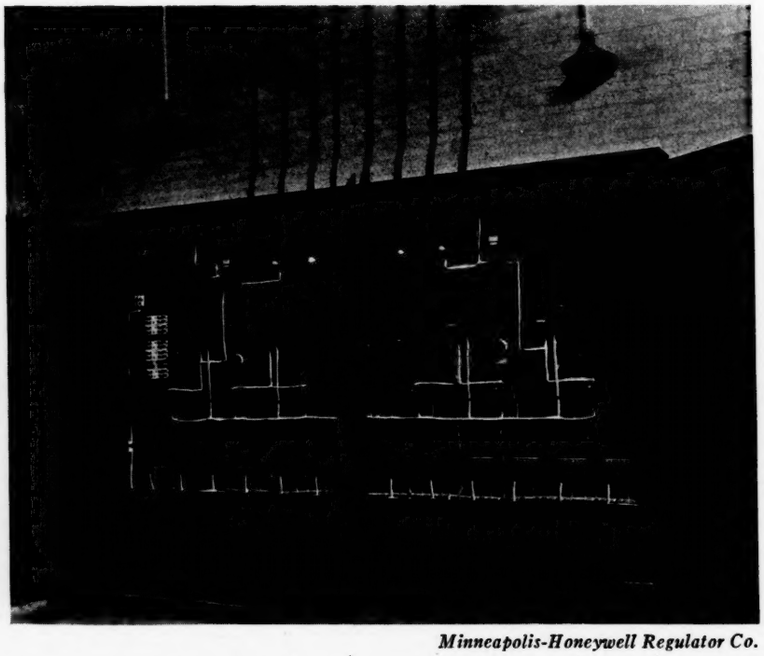
TO get modernizing work it is essential that a case be made out which will really impress the owner and prove to him that it is to his own interest to do the job. Operating cost is the subject in which he is most vitally interested and a proposal which shows him a net and attractive return is the only one likely to receive a serious hearing. With wages and costs generally on the rise, anything which promises an operating saving is doubly welcome just now.

Zoning of the system is one of the ideas which has really come into its own in the course of the past very few years. We all know of the serious consideration now given to this subject when a layout of a system in a *new* building is being discussed. We all know fully well, too, of the fine results which have followed the use of zoning in new and recent buildings. Zoning is cutting operating costs in these buildings and is an accepted practice. Now comes the question—"If it will save in new buildings why won't it save in old ones, too?" The question answers itself. Zoning will reduce operating costs in old buildings. In some cities it has been widely used not only in new buildings but in old ones as well. Where this has come about it has resulted largely because there has been someone who has actively solicited this kind of work and who has pushed the job through to completion.

Here, then, is a situation which openly invites study and in which the possibilities are tremendous. Nearly every building which has been built more than five years can be considered as a place to look to see if zoning cannot be undertaken to advantage. Recall that zoned layouts are comparatively new, and also recall how many buildings were put up within the past 10 years before the idea gained any acceptance and you will note at once how few buildings out of the total contain zoning of any kind.

Those who have gone into this kind of work call attention to one fact which is worthy of notice by anyone who is attempting to work out proposals for modernizing by zoning. Zoning is almost never successful, they report, unless the person who plans it is thoroughly familiar with the existing plant and also with the peculiarities of the building and its occupants. In other words, to do zoning successfully you must know the individual building. There are some general rules and there are some general arguments which can be advanced in favor of zoning but they will not stand up without the support of an intimate knowledge of when there is a real necessity for its use, and just how to accomplish it in the particular case.

Nearly all modernization calls for a certain amount of field study or survey work to be done. Proposals for zoning put a premium on this because of the necessity of not only doing what is done with other jobs but in addition one has to collect information covering the way various parts or rooms of the building are used, what they are used for, their hours of use during the day or night, if their use is seasonal, and whether or not there has been marked overheating or underheating in certain parts of the building. Armed with this information the situation can be examined in detail to work out a plan or to dismiss the idea as the case may be.



Minneapolis-Honeywell Regulator Co.

Zoned control with automatic equipment. Control board shows timing devices, relays, and provision for manual control when desired. Motorized valves in supply lines and thermostats not shown. An example of zoned control where day and night temperatures were different and where the operations required were complex. Zoning saves money by careful control of operation.

What Zoning Is

In considering the subject of zoning as a means of modernizing it is also necessary to keep your mind clear regarding the distinction between zoning itself and zoning combined with the idea of automatic or partially automatic control. It is quite possible to zone a building without resorting to any automatic control at all, but on the other hand a zoned arrangement lends itself admirably to automatic control.

Without the use of automaticcontrolsthe modernization work involved in zoning consists of changing

piping—principally the mains—in such a way that any radiator or any section or room of the building which needs heat can receive it at the same time any other section or radiator which does not need heat can be deprived of it. It is perfectly obvious that where all radiators in a building need heat except a very few which do not need it, one thing to do is to follow the conventional plan of locating a hand valve at the inlet and turn off those radiators where heat is not wanted. An alternative, and one which makes this operation automatic, is to use thermostatic valves at the radiators instead of hand valves. This plan is sensible and accepted. What is not so obvious is what to do when the situation calls for most of the radiators to be without heat and only a few needing it at some particular time.

A case in point is where an all-night restaurant is located in a building the other parts of which are used only between 8 a.m. and 5 p.m. and where a central plant in the basement supplies the whole building. Here the situation calls for zoning and an obvious way to do it is to rearrange the mains so that the radiators in the restaurant are independent of those in the other parts of the building. Dividing the main soon after it leaves the boiler and locating a valve in each branch will do this, and is perhaps the simplest case of zoning. From the standpoint of modernizing it is a small change, not expensive to the owner, and has possibilities of large return.

The next case, and one which varies from the other only in the kind of valve installed in each branch of the main, is to use a valve which is actuated by a thermostat. In the simplest case there is but one thermostat and it is remotely located from the valve. These two simple cases illustrate zoning and zoned control respectively. As the requirements of the particular job make it desirable these elementary cases are expanded and multiplied at will. Every riser may be separately valved as it leaves the main and controlled as desired from any convenient point.

With the great variety of temperature-sensitive elements, the power-operated valves, and the interlocks, relays, and time switches which are now available practically any operating cycle or any temperature condition desired can be obtained. There is no reason why any desired degree of either zoning or zoned control cannot be installed in any existing building.

From the foregoing it is easy to note how readily the desired arrangement can be accomplished and how flexible it can be made. This is one of the reasons why this kind of modernizing is desirable from the standpoint of both the engineer and contractor and the owner. The plan proposed can be readily adapted to meet either the owner's ideas or his willingness to undertake either a partial or an extended job. Only as much zoning need be done at any one time as seems desirable. Then more can be done later. Up to the limit where the return becomes unattractive each addition pays, and its return can be separately estimated. This means that the proposal can be flexible, or even arranged by schedule, and can be made to meet the circumstances with a degree of assurance often lacking in other types of modernization work. Labor is not a major problem and estimates for the owner can be made with certainty that the work can be done within the figures set.

Other reasons why zoned control is especially desirable as a source of modernizing include the fact that performance of the equipment can be relied on, help in determining catchy points is readily available, there are enough installations to permit ready reference to satisfied users, and savings resulting can be estimated in advance with a considerable degree of reliability. Financing on deferred payments is no innovation in the sale of much of the equipment and can be arranged.

Where to Look for Zoning Jobs

With this kind of work so attractive a considerable number of people have found ways of unearthing it. As engineers and contractors who are established in business have seen many of the buildings go up and have an intimate knowledge of what went into them, they start off with an advantage over anyone else. The old files of past jobs are a ready source of inspiration. Commercial buildings in existence for five years or thereabouts are the most likely ones. A sure clue is to keep in mind all the while that buildings of mixed occupancy are the ones where the best results can be shown for the owners.

In the larger cities office buildings, apartments or combination apartment and store buildings are reported to be the most likely sources. Others are mixed warehouses, especially those where perishables are stored; hospital buildings and hospital and institutional groups; buildings containing assembly rooms, as well as other purpose rooms, such as schools and theaters of any kind.

Another consideration is often that of the shape of the building, for those which are ell or tee-shaped can often use zoning or zoned control to very good advantage because of the varied exposure in the different parts of the building.

Combining these points with a knowledge of the character of the ownership and its attitude toward keeping up to date will let the likely places be located with a minimum of effort. Then the surveys and active campaign to interest those responsible can get going.

Modernizing Plan Goes to Congress

As predicted in the May issue of HEATING AND VENTILATING, a definite plan intended to stimulate the construction industry was proposed to Congress by President Roosevelt on May 14. Immediately following the message in which the President outlined his ideas, identical bills intended to carry out these ideas were introduced both in the House and Senate. In the House the Bill was introduced by Representative Steagall, and in the Senate by Senator Fletcher. The bills were immediately referred to the Committee on Banking in each body. It was the generally accepted opinion that the earliest date at which these bills could be brought out on the floor is late in May or early in June. While it is confidently predicted in press releases that a program following along the general lines suggested is assured of enactment, it is also true that there will be opposition to some features and the final enactment will probably be held until the closing days of the session, which is expected to be around the middle of June. If this view is borne out, then the plan should be in a position to get under way as soon as the corporations provided for in the plan can be organized and administrative machinery can be set up. The earliest data set for this is approximately July 1. The greatest hazard facing enactment is that the whole proposal may get sidetracked in the early adjournment plans.

Since the whole plan still lacks Congressional approval, there has been no announcement as to who the head of the work will be. Three men are mentioned. One is Frank C. Walker, of the National Emergency Council. Another is Harry L. Hopkins, Federal Relief Administration, while the third is General Hugh Johnson, of NRA, whose name is persistently attached to this plan in spite of repeated denials that he will be connected with it.

As predicted, the plan contains provisions for making immediate loans for modernization work available to building owners on attractive terms and with long-period repayment. The President's full proposal, however, goes much further than this and in doing so occasioned surprise among Washington observers.

As outlined in the bills introduced into Congress, the whole program is divided into four parts, as follows:

1, Modernizing; 2, Mortgage Insurance; 3, Organization of Mortgage Associations; 4, Insurance of Building and Loan Associations.

In order to carry out the plan it is proposed that two new Federal agencies be set up. The Federal Home Insurance Corporation, with a capital of $200 million, is to be used in insuring financial institutions against losses resulting from extensions of credit for the proposed Home Modernizing Campaign. This same corporation is also authorized to insure and amortize mortgages on owner-occupied homes and low-cost housing projects.

A Federal Savings and Loan Insurance Corporation, capitalized at $100 million made available in bonds of the Home Owners Loan Corporation, is authorized to arrange mutual insurance on savings and loan association accounts up to $2500.

The Act, as introduced, also permits private citizens to organize what are to be known as National Mortgage Associations, provided they are able to raise a cash capital of not less than $5 million. Such associations can deal in mortgages, or securities based on mortgages. After receiving a certificate from the Federal Home Loan Bank Board these associations are eligible to membership in the Federal Home Loan Bank and may borrow from these banks, using home mortgages as security.

Walker Issues Statement

A statement by Frank C. Walker issued the same day that the plan was announced clarifies it considerably. The mortgage insurance feature is essentially a method of arranging for mutual mortgage insurance under Government direction whereby the Government-owned corporation is permitted to insure mortgages on existing homes up to 60% of their value and up to 80% in the case of mortgages covering new construction. This feature is expected to remove the fear of mortgages which has been so prevalent among investors recently, and at the same time give financial institutions leeway in which to act. The corporation has been given broad discretionary powers in determining those areas in which insurance can be granted. It is specifically directed that this insurance may not be issued in places where there is a surplus of homes or that it shall not be available to construction which is not socially desirable. It seems apparent that the success of this feature depends on how well investors are impressed with the value of the Government insurance. Setting the maximum value of the loan on new construction at 80% is expected to eliminate financing of second mortgages.

The mortgage associations are to be under rigid supervision and their dealings are restricted to insuring mortgages. It is hoped that this plan will attract capital from financial centers in which there is a surplus of capital to areas in which the funds are insufficient for financing construction. It is hoped that this plan of Government supervision will prove so advantageous that low-cost, long-term financing will be made available.

The proposal regarding insurance of Building and Loan Associations against losses up to $2500 is included in the plan, according to statements of trustworthy observers, because of the effect which the recent insurance of bank deposits has had on these associations. It is reported that since bank insurance went into effect a good many investors in building and loan paper have withdrawn their money and placed it in banks. It is expected that this money will be brought back to building and loan associations and

(Continued on page 91)

An Air Conditioned Street Car

A NEW type of street car for use in Chicago and at present on exhibition there is receiving considerable attention. This car is the result of many experiments carried on in Brooklyn by the President's Conference Committee of the Electric Railway Industry. It is the first experimental car of its kind embodying the special features recommended by the committee and was built in Philadelphia for the Chicago Surface Lines.

Some of the features include air conditioning, streamlining, four types of brakes which include electric, track magnetic, hydraulic, and hand brakes. The new indirect lighting system is pleasing and novel. There is a reduction of some 8,000 lb. in weight over similar cars by redesigning the car trucks and motors. The outer rim of the car wheel is insulated from the axle by laminated rubber sheets as well as the truck being insulated at several points to minimize the noises.

The heating and ventilating system is a departure from the systems used in the older models. The improvement consists of a motor-driven blower unit which supplies a constant flow of air for ventilation and which also distributes warm air for heating. The system consists of air filters, mixing dampers and chamber, insulated ducts, the blower and an electric grid heater, all of which are mounted underneath the floor.

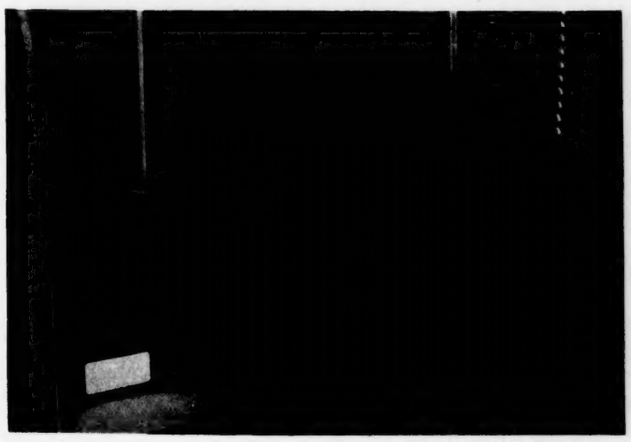
While the ventilating system is in service at all times, in the spring and winter months the heating grid in the plenum chamber is put into use. During this time a part of the air is taken in from the outside louver located at the side of the center door. Next to it, but on the inside, another grille acts as the recirculating air intake. A manual hand-operated handle at the floor under the seats can be set by the conductor, enabling him to adjust the mixing damper with the weather conditions.

The air grid heating unit is divided in two parts, totaling 15 kw.—5 kw. are under manual control for mild weather while the 10-kw. unit is thermostatically operated.

After the air is heated it passes through insulated air ducts under the steps at the center. The duct then splits and runs through the full length of the car inside the body corner posts. The many air outlets are located along the truss planks under the seats near the floor.

The fan capacity for winter operation is 40,000 cu. ft. per hr. During the summer the blower unit is operated to give a capacity of 80,000 cu. ft. per hr., with the idea of having the extra capacity circulate through the car, which will give a slight cooling effect. This also permits a slight air pressure to build up within the car, thus keeping the outside air from coming in. All the air, whether from the outside or recirculated from the inside, passes through separate air filters. The air filters are of a removable type and are thrown away when they are dirty. These are fastened in place under the seat space in front of the air intake louver and recirculating grille louver.

The method of exhausting the vitiated air is through the openings over the top of the windows and then out the exit at the top of the window posts.



(Left) Outside air intake grille at upper right, with recirculating grille at top center. (Right) Air filter at angle in front of inside air louver. Similar filter is placed vertically at the left to clear recirculated air.

Steam Distribution System in Boston Extended

By RAYMOND M. NEE†

Stuart Street, July, 1933, showing the difficulties encountered in the narrow streets

PROOF of the permanence and popularity of the steam service of Boston Edison was shown during the past year by the addition of 10,000 ft. of street mains and services, and by a 12% increase in the number of customers served. The year's operations resulted in a net revenue from the system 23% greater than that produced in 1932.

Extension of the mains, consisting largely of a loop supply to the properties of the First Church of Christ, Scientist, was not only accomplished at very low cost per foot but also permitted the company to contribute toward "making jobs" during a critical period of 1933. Completion of the extensions brought the total of steam mains installed up to 49,678 ft. at the close of the year. It is expected that additional underground mains will be constructed during the present year but will probably not reach the magnitude of last year's program.

Virtually all of the main was in the five sizes from 16 in. to 8 in. with over half of the total falling in the 10-in. size.

The extremely satisfactory cost was possible not only because of the low prices of materials but also because of the availability of first-class labor and the high degree of efficiency of the contractors. Important economies also resulted from the type of underground structure used.

Practically all the main installed last year was in filled land—land reclaimed from a river bed. Consequently, sewers are shallow and nearly all the main had to be drained to sump manholes where pumps and steam ejectors were installed to discharge the inleakage into the sewers.

Much of the construction was difficult because of steam and electric railway lines which had to be crossed or cleared, and to the necessity of crossing a bridge over the main line of the Boston and Albany road.

The problem at the bridge was aggravated by the trains crossing every few minutes during the daytime. Due to the slight clearance between the bridge and the smoke stacks of the locomotives which give off a hot blast of soot, cinders, steam, smoke, gases, etc., which is both very erosive and corrosive to nearby metals, it was decided that the steam pipe after being insulated in the usual manner should be encased in heavy cast-iron pipe with Dresser couplings to join the ends.

In another case it was necessary to pass the main through a basement which extended clear to the curb line or else offset the main to avoid it. Happily an arrangement was made whereby the owner of the building gave an easement to permit passing through his property. This eliminated the necessity of offsetting the line, and also finally resulted in the owner signing up to take the steam service.

Another problem arose in connection with the request of a theater that it be supplied with steam service. The problem was to get an 8-in. main into a narrow street in crowded downtown Boston. The first thought was to go below the existing structures, but that immediately offered complications, the most obvious of which was that the main would be below the sewer, and sump manholes with pumps would have to be installed to discharge all drainage to the sewer. So a cast-iron conduit was devised with electrically-welded longitudinal seams, so that the pipe could be insulated and the cast iron applied, all above ground and lowered into the trench as a completed unit onto a base of concrete. This enabled the installation of the pipe near the surface in between the sub-structures already there.

†Head of Engineering Div., Steam Heating Service Dept., The Edison Electric Illuminating Company of Boston.

Combination Power and Heating Plant at Zurich

INTERESTING details concerning the combination power and heating plant at Zurich, Switzerland, have become available. They indicate that this plant is an excellent example of economic cooperation between a hydroelectric power plant and a heating power plant.

The heating plant supplies hot water and steam to the lecture rooms and laboratories of the Swiss Federal Institute, to the University of Zurich, and to the clinics attached thereto. Distribution is through two separate heating systems at 156 lb. and at 28 lb. per sq. in. The steam for heating can be generated at 1400 lb. per sq. in. and expanded through a primary stage turbine down to 468 lb. per sq. in., thus generating power. Steam generated in two other boilers or, in case of need, steam from the 1400-lb. system after passing through an automatic reducing valve can be delivered into the same 468-lb. circuit. The steam from the 468-lb. system is expanded in a Brown-Boveri double-extraction two-cylinder condensing turbine. The high-pressure cylinder delivers its power to the generator through a reduction gear, while the low-pressure cylinder is direct-coupled to the generator.

Electric power from the plant is delivered to the public distribution system which is also supplied from hydraulic stations. This arrangement fits into the program of Swiss power production admirably as, in summer, the heating plant delivers little or no power at a time when the hydraulic power stations have excess power available and, in winter, the heating plant can contribute power to the general system, that is to say, at a period when the hydraulic stations have less power available and must have recourse to expensive power from storage lakes. It should be noted that the power produced in the heating plant is very cheap and is less than half the cost of that produced in the storage-lake plants.

Because of the operating conditions the governing of the turbines presented a complicated problem. At various times the operating conditions are as follows:

(1) As a double extraction condensing turbine, the pressures at the two extraction branches, 156 lb. and 28 lb. per sq. in. being maintained constant by means of oil-controlled valves. The speed governor regulates the load and holds the speed constant. The speed governor of the low-pressure cylinder is cut out and only intervenes as a limiting governor when the admissible speed is exceeded. The low-pressure cylinder operates independently of the heating requirement and generates the electric power required by the system.

(2) As a single extraction condensing turbine, the pressure at the 156-lb. extraction branch being, alone, maintained constant. Here, as well, the electric power required for the system is generated independently of the heating requirements.

(3) As an extraction back-pressure turbine, with uncoupled low-pressure cylinder, in which as much steam flows through the turbine as is required at the two extraction branches, 156 lb. and 28 lb. The speed governor is cut out and only intervenes as a limiting governor. The electrical power generated is dependent on the heating requirements and, if necessary, the balance of the electric power required must be made up by the municipal distribution system.

(4) As a low-pressure condensing turbine, with uncoupled high-pressure cylinder. The speed governor of the low-pressure cylinder governs the output. The steam is either delivered from another back-pressure turbine or, after throttling, in reducing valves, from the 468-lb. or 156-lb. steam system. The electric power generated is independent of the heating.—*C. H. S. Tupholme.*

Heating Aquariums

HEATING of aquariums offers some special problems. Accurate control of the temperature is particularly important here as many tropical fish cannot stand temperature variations.

In many cases the tanks are not directly heated but obtain their heat from the room. This is an inexpensive and convenient method when there are a number of tanks in the room and when the temperature of the room is not lowered during the night. If the tanks are large, 50 gal. or over, room temperature drops will not affect the water greatly if the tanks are covered. If the drop is large or over long periods of time, some special means of heating must be provided.

The best method is by means of a thermostatically-controlled electric immersion heater. With one of these the temperature can be held within 1° of the required point. A rule for determining the size of the heaters is to allow 2½ watts per gal. for each 10° of maximum temperature difference. Thus, a 15-gal. tank kept at a temperature of 80° in a room where the drop may be to 60° would require a heater of 75 watts.

Unless the tank is continuously aerated, the heater should not get hot enough to form bubbles as this drives the air out of the water. Also, in order to get the proper heat distribution, the heater should be located near the bottom of the tank. If it is kept at the top no convection currents will be set up and the lower portion of the water will not receive any heat.

Coal Classification to be Standardized; Symbols Indicate Characteristics

THERE has in the past been no generally agreed method of classifying coal. All sorts of methods have been proposed, some quite complicated, but most buyers and users of coal follow their own ideas as to just what they call for in their specifications. Progressive buyers, even though small users, have for years specified the heating value of the coal that will meet their purposes, but experienced purchasers usually require more information. Large users, such as railroads, often have elaborate requirements as to coal specifications.

The American Standards Association and the American Society for Testing Materials have for some time been working on tentative specifications for the classifications of coals by rank and grade, and their present proposal is to use symbols to convey what ordinarily would call for a rather large number of words. For instance, in expressing the characteristics of a certain coal, we would find the symbols (62-146) 132-A8-F24-S1.6. This cryptic phraseology indicates the following:

The 146 is the heating value in hundreds of B.t.u. per pound on the moist basis; the 62 is the percent fixed carbon on the dry basis; the parentheses indicate that the contained numbers are on a mineral-free basis; the 132 is the net heating value, to the nearest hundred; the A8 indicates that the ash content is between 6% to 8%; the F24 represents the ash fusion temperature group in hundreds (that is, this coal would have an ash-softening temperature of between 2400° and 2590°), while the S1.6 indicates a sulphur content of 1.4% to 1.6%.

It is seen that there are two separate classifications involved—that by grade and that by rank. As to the rank, the basic scheme of classification is according to fixed carbon and calorific value (expressed in B.t.u.) calculated to the mineral-matter-free basis. The higher-rank coals are classified according to fixed carbon on the dry basis and the lower-rank coals according to B.t.u. on the moist basis.

Coals showing average weathering indices of less than 5% shall be considered non-weathering, a coal showing average weathering indices of 5% or more shall be considered weathering from the standpoint of classification.

Coals having average agglutinating indices of 500 g. or more at a ratio of 15 parts sand to 1 part coal shall be considered agglutinating from the standpoint of classification.

When agglutinating or weather properties enter into the classification of a coal, they shall be expressed outside and immediately following the parenthesis by the following symbols:

ag. = agglutinating
na. = non-agglutinating
we. = weathering
nw. = non-weathering

The table below indicates roughly the classifications of coals by rank.†

According to A. C. Fieldner, chairman of the sectional committee on the classification of coals, the combination of fixed carbon and B.t.u. was chosen by the committee because (1) these figures are nearly always available or may be obtained at small cost; (2) this method more nearly conforms to long-established American usage.

The committee decided that the typical, or bed-moisture, content must be recognized when classifying lignitic, sub-bituminous, and the higher-moisture bituminous coals, but that it was unnecessary to use the moist basis when classifying the high-rank bituminous and anthracite coals.

Calculation to the mineral-matter-free basis has been specified for the classification of coal by rank. For accurate work, the ordinary "ash-free" basis is not satisfactory, since the weight of ash left in the standard determination is distinctly less than the weight of mineral impurities present in the raw coal. This is due to loss of water from hydrated minerals, carbon dioxide from carbonates, conversion of pyrites to iron oxide, etc. Studies have been made of float-and-sink methods and acid treatments to obtain low-ash or ashless coal, and exhaustive studies have been made of several average correction formulas which can be applied to the regular analyses.

It was found desirable to include agglutinating specifications in establishing the boundary between anthracite and bituminous classes, and bituminous and sub-bituminous classes. Should an agglomeration test, now being investigated, prove to be more satisfactory, it may be substituted for the agglutinating test.

Group	Limits of Fixed Carbon or B.t.u. Mineral Free Basis	Requisite Physical Properties
Meta-anthracite	Over 98% dry F.C.	Non-agglutinating
Anthracite	92 to 98% dry F.C.	
Semi-anthracite	86 to 92% dry F.C.	
Low volatile bituminous	77 to 86% dry F.C.	
Med. volatile bituminous	69 to 77% dry F.C.	
High volatile A bituminous	Less than 69% dry F.C.	
High volatile B bituminous	13000 to 14000 B.t.u. moist	Either agglutinating or non-weathering
High volatile C bituminous	11000 to 13000 B.t.u. moist	
Sub bituminous A	11000 to 13000 B.t.u. moist	Both weathering and non-agglutinating
Sub-bituminous B	9500 to 11000 B.t.u. moist	
Sub-bituminous C	8300 to 9500 B.t.u. moist	
Lignite	Less than 8300 B.t.u. moist	Consolidated
Brown Coal	Less than 8300 B.t.u. moist	Unconsolidated

†The complete tentative table is published in the April, 1934, issue of "Industrial Standardization," the official publication of the American Standards Association.

The Present Status of Air Conditioning

WHEN in past issues we reviewed the situation surrounding air conditioning equipment of the kind which might be readily used in small to medium-sized buildings, the story largely had to be confined to discussion and description of the equipment available (See October, 1932, and July, 1933, issues of HEATING AND VENTILATING). The reason for this was that the equipment itself and its recent appearance were the outstanding facts. In other words, the equipment for these applications was passing through the development stage and was just making its appearance in commercial form. This period, it should be recalled, followed the intense general publicity given to air conditioning in 1930 and 1931. Manufacturers were being attracted from other fields and those already engaged were realigning their products.

During the past year there have been evidences that the closing phase of the development and announcement stage is at hand. Not only have fewer new manufacturers appeared with new products of this class, but selling plans, installation and estimating methods and data, and organization for sales are becoming more and more important subjects. Attention to these subjects usually indicates that the equipment development is approaching stability and this is usually the close of the experimentation and announcement stage. The scene is being prepared for the selling stage. Because of this situation our review now includes not only an outline of the equipment changes and trends in the past year, but also sketches events which have a bearing on the selling and applicational phases.

A year ago one of the principal points of interest was the large number of manufacturing firms who were entering products in air conditioning for the first time. Now this is not nearly so noticeable. Rather there has been a tendency for those with products—and who evidently seriously expect to continue to stay in—to round out their lines or else to offer specialties.

A surprisingly large number of air filters were placed on the market during the year. Since last July no less than seven manufacturers have brought out new, or essentially new, filters of the unit type. Most of these are of such construction and dimensions that they can be used on air conditioning equipment in buildings of small to medium size.

The other class of equipment which continued to appear throughout the year was humidifiers. Eight were distinctly of the domestic or single-room type and free-standing or portable. In addition, there was equipment for attaching to existing column or tube radiators or for attaching to steam or hot water piping. Several new humidifying radiators of special design also appeared. Humidifying equipment continued to hold its place as the most popular type with manufacturers. It is still true almost without exception that any one who aims at any diversified line of air conditioning products starts off with a humidifier. In number and variety of items and design, humidifiers still are supreme.

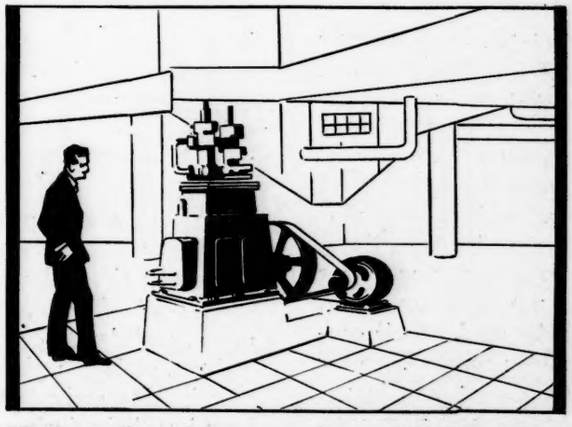
These two classes of equipment—filters and humidifiers—accounted for over half of the items which appeared during the past year.

As during the months preceding July, 1933, so during the past year but few new products were announced which are essentially air conditioning furnaces, or the newer version of what were formerly warm-air furnaces.

Most of those which are now available appeared late in 1931 or early in 1932, when the movement on the part of warm-air furnace-makers to introduce fans and filters reached its height. Three makers have announced fan-and-filter units to be added to existing furnaces while five new designs of the integral type wherein the fan and filter are built into the furnace were announced.

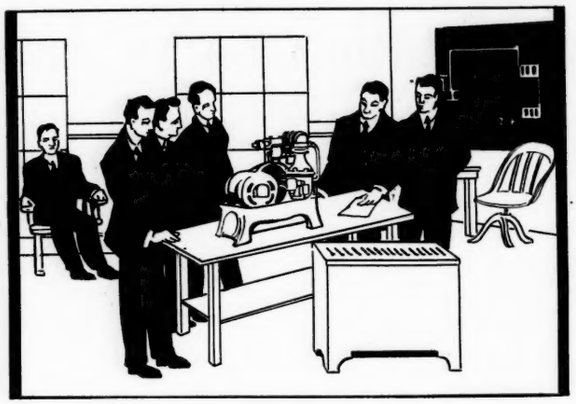
It is notable that the previous tendency of planning such furnaces for use with either oil or gas as a fuel continues. Only one coal-fired furnace of this type appeared. It would seem that this tendency has now reached a point where it can be regarded as pretty well established as a practice. That is, basement-type, central, warm-air furnaces when built integral with fans, filters, etc., are for use with gas or oil. This would tacitly recognize what has been more or less evident for a long time, viz: in the case of residences when the owner is willing to accept the idea of air conditioning he is also willing to accept oil or gas as a fuel.

Unit conditioners of the free-standing, cabinet enclosed type continued to appear. Whereas they were an innovation only two years ago they are now numerous. There were no outstanding developments, for the design—and to some extent the construction and appearance—of this class of equipment is now proceeding along well-defined lines. The cabinet is invariably well finished in furniture steel, contains a fin-type coil or exchanger, some kind of filtering device, a fan, and other features depending only on the particular model. Strangely enough, there is less emphasis on humidification in this class of equipment than on most other types. Including a refrigerating compressor right inside the cabinet is now an accepted practice. As these cabinets approach a state of development where but a minimum of field engineering is re-



"Reciprocating piston compressors, belt-driven from electric motors, are still the most used machines."

quired, they appeal especially to manufacturers who are looking for a product which can be pushed to volume sales. They are readily adaptable to existing buildings and so long as so much of the available business is in buildings of this kind, these units fit well into selling plans. For the engineer and contractor they present but limited possibilities for exercising his function. The technical problem is to fit these units into the requirements of the job while the installation work is not great.



"Reflecting . . . the general interest in the subject of air conditioning . . . night and day school courses are now available in nearly all of the larger cities."

Cooling

Refrigerating equipment intended especially for air conditioning uses continues to receive close attention. As the space requirements, the load characteristics, and the exact nature of the air conditioning problem are gradually becoming better defined, more and more attention is being turned specifically to it by the makers of refrigeration equipment. There has been a tendency to look into the problem from the angle of the refrigerant, the cycle, and the motive power as well as to recognize the necessity of dependable operation and economic cost. Cheapness, safety, and satisfactory operation are now well recognized as the primary considerations.

Equipment for use with steam as the refrigerant, while no innovation, not only continued to appear, but that on the market enjoyed good acceptance during the past year. There are now eight makes of this equipment. A distinct innovation was the direct steam vapor compressor described in HEATING AND VENTILATING in March, 1934. So long as steam-using refrigerating equipment holds its present advantage of first cost there is reason to believe that it will come to dominate the market in the large-sized installations, for high-pressure steam can usually be made available easily. As yet but little operating information is at hand and its absence, while a temporary disadvantage, will soon be rectified from the fairly numerous installations now in existence.

In electrically-driven equipment there have been no notable changes in the general type. Reciprocating piston compressors, belt driven from electric motors, are still the most used machines. Developments have been along the lines of securing greater compactness, quietness of operation, manufacturing economies, and freedom from mechanical troubles. It is notable that makers of this equipment have attempted to get volume of production by making their lines in such a way that their "commercial" machines for use in cooling meat boxes and similar spaces can also be used for air conditioning either directly or with minor changes. So far as observable there was no particular change in the refrigerants used and methyl chloride is still a favorite.

Closely related to refrigerants and refrigerating machinery is the use of silica gel as a means of drying air. Its applications until recently were in central plants, but the principle is now reported to have been applied to room units.

The reversed refrigeration cycle for heating is also of interest in this connection. No notable equipment using it has appeared recently. The direct room unit announced a year ago (see HEATING AND VENTILATING, July, 1933) has not been actively pushed commercially and operating data are still lacking.

While railroad air conditioning equipment is not the present subject, it is interesting to note in passing that there has been no outstandingly new or unique developments attached to it. The equipment and methods are both largely adapted from those used for comfort conditioning in buildings.

Available Information

Regardless of the state in which equipment stands at any time, it can actually be applied and used only as there is a sufficient reservoir of information on which to draw in actually applying the equipment to the job. Applicational information must advance at least as rapidly as the advance of equipment requires.

In applying the equipment there have been four points which have caused concern. One is the actual lack of basic information on which to judge the load which a given piece of equipment for use in small to medium-sized buildings will be required to work against. This is of the utmost importance for it affects both cost and performance. Second, is the absence of definite, simply-applied rules for using the information where it is at hand and for estimating in cases where definite information is lacking. Absence of such rules severely cramps anyone who goes to apply the equipment. Third, is the fact that what information there is is not widely enough held so that application can proceed easily. Fourth, is the difficulty of predicting in advance either the first cost of a completely installed job or the operating cost. As these are questions which the prospective buyer always raises it is important that a sufficiently reliable answer be available.

Nearly all of those troubles can be traced to what may be generally called technical and educational phases. In general it can be fairly said that these matters have not kept pace with the actual appearance of equipment. However, considerable has been done to help solve the difficulties. It is not possible to list or discuss all of them, but some of the more important events and developments can be briefly mentioned.

As regards the absence of really basic information on which to make estimates of capacity, progress has been but slight during the past year. Collection of this kind of material is exceedingly difficult because of the

essential complexity of the heat interchanges and flows. So true is this that it is not possible to wait for such information in full and the best that can be done is to use the fragments which are available and estimate where exact information is lacking.

For winter loads the problem is well enough in hand and sufficiently applicable so that most of the attention is focused on the summer load. With so difficult and complicated a problem it is not surprising that the actual advances have been further narrowed to some of the more pressing details. Among these are the questions of when the daily peak load actually appears, the credit to be given to awnings and similar window coverings, the sun load, and the conditions of temperature and humidity to be maintained inside the building.

Work at the University of Illinois leads to the suggestion that the daily peak occurs in the late afternoon generally, but this finding is not fully confirmed, or reduced to practical usefulness. A study at the A.S.H.-V.E. laboratory with various window coverings resulted in showing that where an outside awning is used only about one-fourth as much sun heat finds its way into the room as when a window is completely uncovered. An inside shade cuts off about half the sun heat. Maximum values of sun heat which can fall on a building were shown by G. A. Hendrickson and J. H. Walker in a paper in the June, 1933, issue of HEATING AND VENTILATING. Studies have shown that the usually accepted standards for the inside conditions to be maintained may be considerably modified. Common practice is to maintain higher dry bulb and higher wet bulb than formerly in summer. Unfortunately, there is still no agreed-upon method of determining them, as facts are lacking.

While there has thus been an immense amount of effort put forth to get basic information for summer cooling, but few concrete and usable facts have appeared during the year.

Absence of simple and easily applied rules has been overcome to some extent in the case of standard room units by the preparation of standardized methods of computation on the part of many makers of equipment. These rules are usually in the form of short cuts depending on assumptions that the units will typically go into buildings of ordinary construction. There is little agreement in detail in the methods used and the necessity for extended tabulation makes it impracticable to present the full details of any of these methods here. Virtually all of them include items to take care of sun load, lights, and persons, in addition to conduction and infiltration. The conduction and infiltration quantities are arrived at in the same way as for heating and there is substantial agreement in these parts of the method.

"Offices appear to use their cooling equipment freely, for their reported operating days were greater than those of other types of buildings."

There is no doubt that the lack of more nearly standard methods is serious, especially where there is competition between various proposals on a given job. The result often is that the buyer is given such an array of estimated costs that he decides there must be something wrong with all of them. The trouble is slowly righting itself but is still a pressing problem, and a satisfactory solution is still some distance off.

Printed performance figures on equipment are difficult to arrange in such a fashion as to be easily followed. Manufacturers found it necessary to offer training in the use of their own catalogs to their own employees and training courses and sales conferences had to give considerable attention to training in methods of selecting equipment from the performance figures. To some extent this condition reflects the newness of this field, and goes to show how closely held the information was up until very recently. Now the industry as a whole is being held back by this very fact.

Reflecting both the general interest in the subject of air conditioning and the realization on the part of many people that it is a promising field, has been the appearance of several text books and the inauguration of public courses of instruction. Night and day school courses are now available in nearly all of the larger cities and in the main are designed especially to convey technical information and information on the equipment available for use. These schools and courses together with the sales and technical instruction being offered by manufacturers are helping notably to remedy the lack of trained personnel.

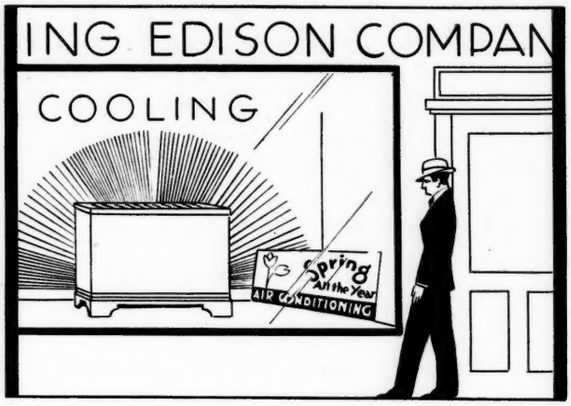
Operating Costs

Figures on operating cost appeared from a variety of installations. Several of the utility companies not only installed plants in their own buildings and kept records of operating cost on them, but they also metered many installations in other buildings as well. This has resulted in a considerable body of figures showing operating costs, quantities of water and electricity required, hours of operation, and load characteristics. Methods of reporting are so diversified, though, that accurate evaluation of the results is still not possible. Collection of this operating material is certain to bring to light much valuable information, however, regardless of uniformity of results reported. Even now there are available enough operating results to help in arriving at reliable forecasts.

The following data have been collected from various places and represent the cream of the operating facts brought to light during the past year.

Banks: Operating reports include installations ranging from those where only in-

dividual offices are conditioned to those wherein both banking rooms and offices are conditioned. Too few installations are reported to permit any conclusive results. It appears that they are mediumly free users of their installed cooling equipment for the number of days of summer operation falls between those of offices and restaurants on the one hand and residences on the other. The fact that they are closed most of the day on Saturdays and closed on Sundays probably explains a good deal of this. In general they report relatively small seasonal operating costs, but whether this is due to operating methods, short hours of use, or to high-grade installations is not clear. Reported costs range from 4 cents to 15 cents per 1000 cu. ft. per operating day in two banks in the same city. Highest operating cost was 80 cents per 1000 cu. ft. per operating day in a midwest city where the days of use during the season of 1933 were few.



"One of the developments of the year . . . is the attitude taken by many prominent utility companies in promoting the use of air conditioning."

Offices: Appear to use their cooling equipment freely, for their reported operating days were greater than those of other types of buildings. There is no information as to how long daily users they are, however. The lowest reported operating cost figure was 10 cents per 1000 cu. ft. per operating day, and the largest was 40 cents. Again, these results are from two installations in the same city.

Residences: While the reports are from relatively few installations, they bring out rather well that these buildings are sparing users of their mechanical cooling plants. In the same cities from which operating results were reported for cooling plants in other types of buildings, residences were reported as using their plants fewer days during 1933 than the others did. This finding is in line with what would be expected, for the residences in which cooling would be installed lie in the cooler and more open parts of a city. Where daily operating methods were shown, it was reported that the cooling plants usually were operated only in the late afternoon and evening hours. Total operating costs for the season were modest, with bills running to the neighborhood of $150 to $250, rather than higher. The largest user of record was where one residence owner put nearly $3000 into a cooling installation and spent over $600 in keeping two rooms of his house cooled in a southern city. Operating costs varied from 40 cents per 1000 cu. ft. per operating day up to $1.50.

Restaurants: Little can be learned from the available reports on restaurants because of the complication introduced by the varying methods of operation. Naturally, three-meal or all-night restaurants show larger use of their cooling equipment than do two-meal establishments. Available reports do not make clear the distinction between the several kinds of restaurants.

It is to be noted that the operating figures mentioned are not confined to strictly out-of-pocket expense, as they include suitable allowance for charge to overhead on the equipment investment. It is also important that the figures be understood as fragmentary, for there is still nothing like consistency in them. Properly used, however, they convey an impression of what costs are like at the present time in plants operating under control of their owners and paying current prices for power and water.

Utilities and Air Conditioning

One of the developments of the year which should not be passed over without comment is the attitude taken by many prominent utility companies in promoting the use of air conditioning. During the year a number swung to the policy of actively promoting it instead of merely standing by to assist when the opportunity offered. There is still a sharp difference of opinion among utility managers as to exactly what should be done. One school feels that the equipment is not yet advanced enough, or the public well enough able to buy, to warrant their doing anything active. Others take the opposite view and feel that the time to help air conditioning is the present. Enough accepted this view during the past year so that the utility influence became important. Few went into actual merchandising of air conditioning equipment. A considerable number installed trial and demonstration equipment in their own buildings, held exhibits, offered advice, organized departments, made surveys, put in test meters, advertised locally, and collected and published figures showing current progress. This was in addition to the technical studies undertaken, and the elaborate testing plant for unit conditioners set up in New York.

The latter part of 1933 really saw the beginning of attempts to push air conditioning equipment as more or less merchandising goods. It is notable, though, that in the great majority of cases the plans included some form of recognition of the necessity of devoting a certain amount of engineering and planning to the installation. Plans for 1934 also almost without exception make a reservation to take care of engineering. Air conditioning equipment even of the unit type is not over-the-counter merchandise, and the service problem has scarcely been attacked at all. From the events of the past year it is not yet clear just what course the selling of air conditioning equipment will finally take or to what extent it may be necessary to devise new and peculiar plans for it. Neither is it yet clear to just what extent the technique of application can be simplified and standardized. These are phases which are likely to receive increasing attention as months go by.

Legal Division of NRA Claims Oil Burner Code Assessments Illegal at Hearing; Costs Criticized; Hammers Replies

THE first public hearing at which an NRA Code Authority was required to give an account of its stewardship and hear objections and criticisms from its industry was held May 8 by order of National Administrator Hugh S. Johnson, when the code for the oil burner industry was discussed before Deputy Administrator Barton W. Murray in the auditorium of the Department of Commerce Building.

Criticism of the code came from all sides—dealers, manufacturers, retail stores, mail order houses, and included criticism of the amount of assessment levied against the industry for the support of the Code Authority; of the vertical nature of the code (which includes retail distributors of domestic burners as well as manufacturers, and covers also manufacturers of industrial oil burners); and of the narrow limitation of working hours, particularly of service men, during peak seasons.

Figures were submitted by Morgan J. Hammers, chairman of the Code Authority, to show expenses and income of the Authority. Since the approval of the code September 18, the Code Authority has collected $67,748.17 from the industry and disbursed $64,576.82. The three chief items of expense were—salaries, $25,633.18; travel, $8,684.66, and legal services, $14,294.01.

Mr. Hammers was questioned by Mr. Murray regarding certain items in the Code Authority's cash statement, notably one for $5,400 paid to him as "expenses of organization" and $12,000 to the American Oil Burner Association. Mr. Hammers explained the first as compensation to him for three months' work performed after he left his own company about the first of October, 1933. He added that for January, February, and March of this year he had been compensated at the rate of $1,250 a month. The $12,000 item was reimbursement for work done while the code was being drawn.

One of the most important points raised during the hearing was that regarding the right of the Code Authority to assess the oil burner industry. The Oil Burner Code, Article II, says, "Each member of the Industry, subject to the jurisdiction of this Code and accepting the benefits of the activities of the Code Authority hereunder, shall pay to the Code Authority his proportionate share of the amounts necessary to pay the cost of assembling, analyzing, and publication of such reports and data, and of the maintenance of the said Code Authority and its activities; said proportionate share to be based upon value of sales, as the Code Authority, with the approval of the Administrator, may prescribe for each division or subdivision."

Mr. Murray questioned Mr. Hammers whether the method and amount of assessment had been approved by the Administrator. Mr. Hammers replied that the Code Authority had been informed by R. B. Paddock, then Deputy Administrator, that he was approving it for the Administrator.

Mr. Murray placed in the record a memorandum from C. J. Munz, Jr., of the NRA Legal Division, in which that division expressed the opinion that the levies had been made without the legal right to do so which could only follow the approval of the Administrator himself and that therefore the Code Authority had no case against one oil burner maker for non-compliance because of his refusal to pay the assessments.

It was pointed out, following the hearing, that the legal division is technically correct, since General Johnson has never given his deputies the specific right to approve acts which he is empowered by law to approve himself. However, the Code Authority has been forced to obtain rulings on other matters from deputies, as Administrator Johnson cannot personally rule on all the many details which arise.

In opening the hearing Deputy Administrator Murray called attention to the fact that the Oil Burner Code was the 25th approved, and that in line with the Administration's established policy, the hearing has been called because it was evident that the code was not satisfactory to all affected by it.

Milton A. Powers, vice-president of the Timken Silent Automatic Co., Detroit, the first witness, said that the assessments collected were "wholly out of line with the needs of efficient operation of the Code" and asked that the matter be thoroughly investigated. He also made the point that, in peak seasons, the limitation of hours was too stringent, especially as they apply to installation and service men.

He said that there was a great scarcity of such men competently trained, and that due to the limitation of hours and therefore of their earning capacity the men were rapidly going into other industries. Their men are being paid from 50 cents to 90 cents an hour, the average being 65 cents. He proposed that they be permitted to average 48 hr. over the course of a year with no more than 60 hr. in any one week.

William C. O'Neil, speaking for the Building Trades Department of the American Federation of Labor, protested against any lengthening of hours and insisted that if the industry needs more skilled installation and service men it should "give the young fellows a chance and not make it a feast for some and a famine for others."

The vertical aspects of the code were criticised by both I. C. Fox, of the National Retail Dry Goods Association, and by O. M. Kile, of the Mail Order Association of America. Mr. Fox gave it as his opinion that the retailing of oil burners should be under the retail code and wholesaling should be under the wholesale code. The oil burner code should be entirely a manufacturer's code, he said.

Norman H. Fuhrman, speaking for three Philadelphia dealers, said that the code should be split in half, one section to cover the dealer and the other to cover the manufacturer. He claimed that the Code Authority was not enforcing the code and that it was being ignored by dealers in his vicinity. He also said that stringent regulation of the terms under which oil burners must be sold under the code was making it impossible to compete with gas heating equipment which is being sold by utilities on much easier terms.

Edward P. Bailey, president of the National Air-Oil Burner Corporation, and representing the Industrial Oil Burner Equipment Association, voiced the viewpoint that manufacturers of industrial burners should never have come under the Oil Burner Code at all, due to the fact that the design, installation, method of merchandizing and, in fact, practically everything about industrial burners is different from the domestic burner, except that they all use the same fuel.

Thomas A. Walsh expressed the views of numerous oil burner dealers on the Atlantic seaboard as far north as Boston, who complained that the code was not being enforced, protested the assessment, and complained that dealers were being put out of business by public utilities selling gas heating appliances with no down payments and 10 years to pay.

On the day following the hearing, an Associated Press despatch was pub-

(Continued on page 69)

A Time-Saving Method for Figuring Heat Loss

Sales engineers and estimators can quickly determine the required size of heating equipment for small buildings without measuring each room in detail

By E. A. BAILEY†

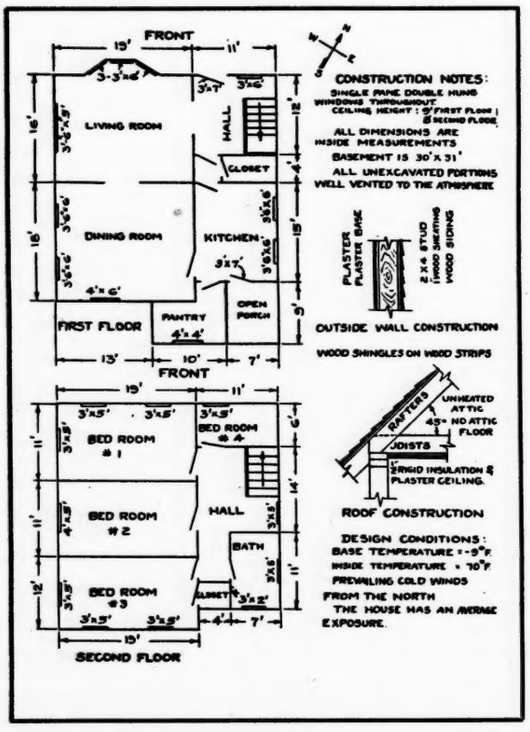
IN the application of heating and winter air conditioning equipment to residences it is desirable to have a rapid and fairly accurate method of estimating the heat loss of the building. This estimated heat loss can then be the basis of the selection of the size of heating equipment and the estimation of approximate operating costs. Such a short method is especially valuable where no radiators are already installed; that is, a new building or one which has warm-air heat.

If the building already has radiators, a rough estimate of the heat loss can be made by counting the number of square feet of radiators and assuming that just enough radiators have been installed to keep the building warm on the coldest day. The short form heat loss survey is valuable in this case in checking whether the residence is under- or over-radiated. However, it should be borne in mind that the actual radiators installed, plus pipe tax and pick-up, constitute the actual boiler load. Enough boiler capacity must be installed to handle this load or some radiators will be slow in heating. This statement particularly applies to steam systems.

The short form heat loss method described herein is based on the principle that if the heat transfer coefficient for each type of surface is multiplied by the ratio of this surface to heated volume, called the coefficient multiplier in the form shown in Fig. 2, the product may be multiplied by the heated volume to obtain the heat loss for that surface. Thus, it is only necessary to multiply each coefficient by the corresponding ratio (multiplier), add the products and multiply the sum by the heated volume of the home to determine the overall heat loss in B.t.u. per hour per degree. The sum of the products is called a factor. The curves shown on the accompanying blue data sheet are plotted with the volume of the building against heat loss in B.t.u. per hour per degree. The curves make allowance for the fact that the ratio of surface to volume increases as the home gets smaller while the coefficient multipliers given in Table 4 on the blue sheet are average ratios of surface to volume.

Coefficient multipliers were determined from a study

†Air Conditioning Department, General Electric Company.



Owner	——									Date			
Address	——									No. of Stories	2		
City	Schenectady, N.Y.									Estimator			
HEATED VOLUME - Cu. Ft.													
Story	Main Body Length x Width x Height = Volume				ELL Length x Width x Height = Volume				ELL Length x Width x Height = Volume				Total
1	33	30	9	8900	10	6	9	540					9440
2	33	30	8	7920									7920
3													
											Total Heated Volume		17360

WINDOWS and EXTERNAL DOORS*						
Side	Full Windows (Allow 1)	Half Windows (Allow ½)	Other Windows (Allow ¼, 2 etc.)	Doors (Allow 2)	Double French Doors (Allow 4)	Total No.
North	10			2		12
East	6					6
South	7			2		9
West	10					10
* One equivalent window = 12 sq. ft.				Total Number of Equivalent Windows		37

CALCULATION OF FACTOR					
	(Transmission Coeff.)	(Coeff. Multiplier)	= Factor	Expos. Factor (1.07) x Total Factor (.102) = Overall Factor (.109)	
				Heat Loss, B.t.u. per hr. per deg. (From Fig. 2 and 3)	2050
Wall	.26	.100	.026	Compactness (Deduct or add 5% see Explanation)	102
Roof	.14	.083	.012	Total (or Difference)	1948
Window Coeff. (30) x No. Windows (37) / Volume (17360)			.064	Add Unex. Floor Area ( ) x.2	——
		Total Factor	.102	Total Heat Loss per degree	1948

Heat Loss B.t.u. per hr. per deg. temp. diff. (1948) x Temperature Difference (79) = (153,000) Total Heat Loss, B.t.u. per hr.

Figs. 1 and 2. Plan of typical building for which example is worked out on the sample form, shown to the right

SHORT FORM HEAT LOSS ESTIMATE

Owner	Date
Address	No. of Stories
City	Estimator

HEATED VOLUME - Cu. Ft.

Story	Main Body Length x Width x Height = Volume	ELL Length x Width x Height = Volume	ELL Length x Width x Height = Volume	Total
1				
2				
3				
			Total Heated Volume	

WINDOWS and EXTERNAL DOORS*

Side	Full Windows (Allow 1)	Half Windows (Allow ½)	Other Windows (Allow ¼, 2 etc.)	Doors (Allow 2)	Double French Doors (Allow 4)	Total No.
North						
East						
South						
West						

* *One equivalent window = 12 sq. ft.* Total Number of Equivalent Windows

CALCULATION OF FACTOR

	(Transmission Coeff.)	(Coeff. Multiplier)	= Factor
Wall			
Roof			
Window Coeff. ( ) x No. Windows ( ) / Volume ( )			
		Total Factor	

Expos. Factor ( ) x Total Factor ( ) = Overall Factor ( )

Heat Loss, B.t.u. per hr. per deg. (From Fig. 2 and 3)

Compactness (Deduct or add 5% see Explanation)

Total (or Difference)

Add Unex. Floor Area ( ) x 2

Total Heat Loss per degree

Heat Loss B.t.u. per hr. per deg. temp. diff. ( ) x Temperature Difference ( ) = ( ) Total Heat Loss, B.t.u. per hr.

Published by Heating and Ventilating, 148 Lafayette St., New York.

EXPLANATION

The above form furnishes a means for quickly estimating the total heat loss of practically any type residence, accurate within 10%.

The heating volume of the main body of the building is determined first. Dimensions of the ells are then obtained, and from these figures the total heated volume computed.

Next determine the number of equivalent windows. An average door of 3 ft. × 7 ft. is taken as two equivalent windows.

The next step is to compute the factor. This factor is a figure which, when multiplied by the heated volume of the building, gives the overall heat loss in B.t.u. per hour per degree temperature difference. Use the coefficients given in Tables 1, 2, and 4 to determine the factors for the walls and roof. For the window factor multiply the window coefficients, as given in Table 3, by the number of equivalent windows and divide by the total volume. Add the three factors together to obtain the total factor.

This figure has to be modified by an exposure factor because of the different exposures of buildings. For a residence with average exposure the factor is 1.07. From these two figures the overall factor is obtained.

Using the total volume and the overall factor the heat loss per degree is obtained from the graphs. If the building is compact, less than 10% of the total volume being in the form of ells, 5% must be deducted from the heat loss. If the ell volume is greater than 25% of the total volume, add 5% to the heat loss.

The unexcavated floor area also affects the heat loss and corrections have to be made for it. If more than 10% of the total floor area extends over unexcavated space, multiply the number of square feet of such area by 0.2 and add to the heat loss.

The heat loss is now in B.t.u. per hour per degree and must be multiplied by the correct temperature difference for the locality to determine the maximum heat loss in B.t.u. per hour.

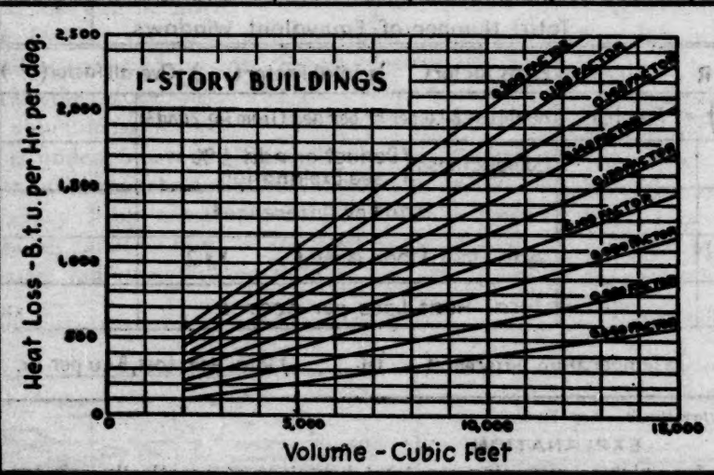
This form cannot be used for buildings having common (or party) walls or ones without pitched roofs. It applies only to detached buildings. It should also be clearly understood that this heat loss method can be used only for checking the total heat loss and cannot be used to determine the size of radiators or duct requirements for individual rooms.

SHORT FORM HEAT LOSS ESTIMATE

TABLE 1- WALL COEFFICIENTS

Type Wall	No Finish		½ in. Plaster		½ in Plaster on Wood Lath	
	8 in. Wall	12 in. Wall	8 in. Wall	12 in. Wall	8 in. Wall	12 in. Wall
Plain Brick	0.50	0.36	0.46	0.34	0.30	0.24
Brick Veneer on Hollow Type Walls	—	0.34	—	0.33	—	0.24
Stone Walls No Exterior Finish	0.71	0.58	0.64	0.53	0.37	0.33
Hollow Concrete Blocks No Exterior Finish	0.56	0.49	0.52	0.46	0.32	0.30

Type Wall	Not Insulated	With ½ in. Flexible Insulation	With 1 in. Rapid Insulation	With Cellular Gypsum Fill	With Flaked Gypsum Fill	With Rock Wool Fill
Wood-Wood Siding or Clapboard frame Walls, Clapboard Shingles or Brick Veneer, 2x4 Sheathing Lath or Plaster Board and Plaster.	0.26	0.16	0.16	0.11	0.10	0.07



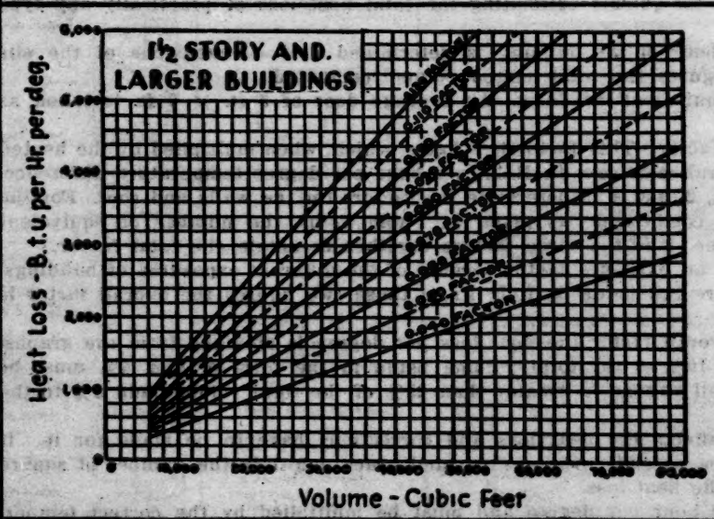


TABLE 2 ROOF COEFFICIENTS

Shingles, tile or slate on wood sheathing, lath or Plaster board and plaster ceiling below attic.

	No Attic Floor	1 in. Attic Floor
No Insulation	0.27	0.17
½ in. Insulation	0.14	0.11
2 in. Insulation	0.12	0.10

TABLE 3- WINDOW AND INFILTRATION COEFFICIENTS

Type Windows	No Weather-strips	Weather-strips
Single	30.0	17.0
Storm	14.0	10.0
Steel Sash Casement	25.0	—

TABLE 4 COEFFICIENT MULTIPLIERS

Type of Residence	Coefficient Multipliers	
	Wall	Roof
1-Story	0.110	0.165
1½-Story	0.100	0.100
2-Story	0.100	0.083
2½-Story	0.100	0.065
3-Story	0.085	0.062

Published by Heating and Ventilating, 148 Lafayette St., New York.

H. & V.'s REFERENCE DATA—34

of several hundred residences in almost every part of the United States. It was found that the ratios of wall area to volume and roof area to volume were very nearly constant for each type of building. However, the ratio of window area to volume was found to be such a variable quantity that it was decided that, in order to keep the method accurate within 10%, the window ratio or multiplier would have to be calculated for each job. Errors as high as 30% were recorded when using an average window ratio.

After the method had been set up, an analysis of 137 residences showed that for 82 the error by the short-form method was 5% or less, for 54 the error was between 5% and 10%, and for one the error was 12%. In each case the answer obtained by the short method was compared with the answer obtained by the standard detailed method of calculating heat loss. About half the errors were positive and the other half negative, indicating that the short method is of good average accuracy.

Method of Use

A form such as illustrated in Fig. 2 expedites the use of the short method. A description of the use of this form follows:

The heated volume can be approximated by filling in the volume section of the form. The dimensions of the main body and ells can be quickly measured. In most buildings it is necessary to take these measurements only on the first story because other stories are generally of the same shape.

A quick approximation can be made of the number of equivalent windows, using the spaces provided on the form. Twelve square feet of window or door area equals an equivalent window. Thus, an average 2½ ft. × 5 ft. window would be marked down as one window. An average 3 ft. x 7 ft. door is counted as two windows.

In the calculation of the factor use the coefficients given in Tables 1 to 3. Use the multipliers in Table 4. If parts of the building are of different construction, the coefficient used should be a weighted average of the coefficients. The window and infiltration coefficient is based on the area and crackage of one equivalent window. The exposure factor must be estimated because the coefficients given are based on a wind velocity of only 15 m.p.h. The exposure factor depends on the amount of exposure of the building to prevailing cold winds and the velocity of the winds. The average exposure factor is 1.07. The product of the exposure factor and the sum of the individual factors equals the overall factor to be used in reading the heat loss from the curves.

If the building is quite compact, less than 10% of its total volume being in the form of ells, 5% must be deducted from the heat loss obtained from the curves. If the ell volume is greater than 25% of the total volume, add 5% to the heat loss. If more than 10% of the total floor area extends over unexcavated space, multiply the number of square feet of such area by 0.2 and add to the heat loss.

Heat loss obtained up to this point is in B.t.u. per hour per degree and must be multiplied by the correct temperature difference for the locality to determine the maximum heat loss in B.t.u. per hour.

Buildings which have walls in common with other homes cannot be estimated correctly by this method because the ratio of exposed wall to volume does not apply to this case. Also, the roof ratios or multipliers apply only to pitched roofs.

Example

A plan of a typical one-family residence with two floors is shown in Fig. 1. The example worked out in Fig. 2 illustrates how to determine the heat loss of this building.

The main body is 30 ft. wide and 33 ft. long, an average length. There is one ell, the pantry, 6 feet × 10 feet.

The number of windows is roughly estimated. Most of the windows have an area of about 18 sq. ft., or one and one-half equivalent windows. Each outside door is taken as two equivalent windows.

Less than 10% of the total volume of the building is in the form of ells, so that 5% has been deducted from the heat loss. The base temperature difference is 70–(–9), or 79°. This gives a total heat loss of 154,000 B.t.u. per hr., which is within 5% of the heat loss obtained by the usual method.

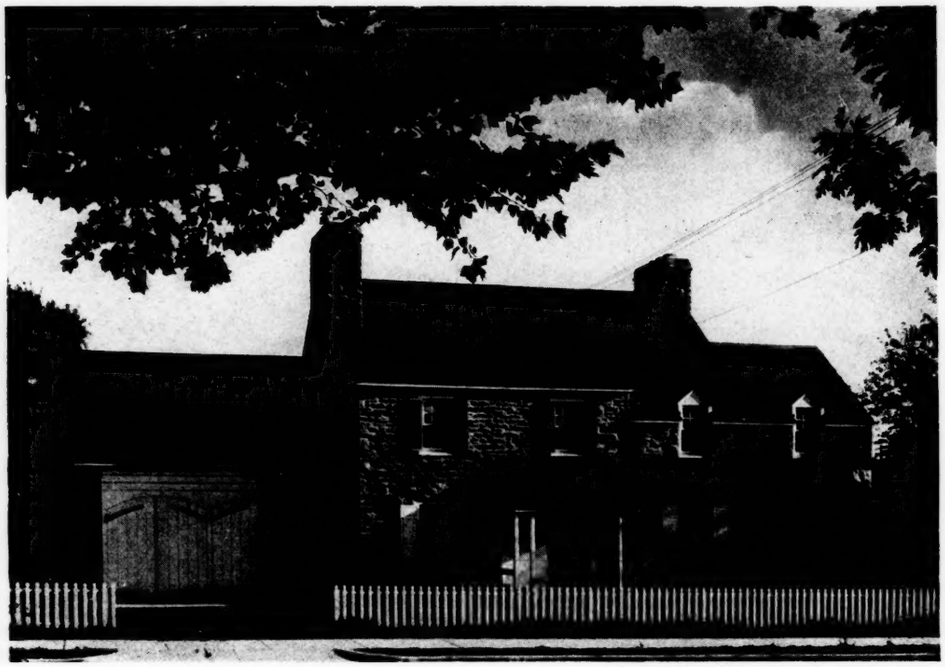
It should be clearly understood that this heat loss method is only for use in checking *total* heat loss, total square feet of radiators, boiler capacity, etc. It cannot be used to determine the size of radiators or duct requirements for each individual room.

Method Proposed for Classifying Anthracites

A METHOD of distinguishing between the anthracites and semi-anthracites of the Pennsylvania coal fields has been proposed by Homer G. Turner, of Pennsylvania State College. He has found that physical properties alone, while serving to distinguish between many anthracites and semi-anthracites, fail when applied to the borderline coals. He has also found that there is a lack of relation of volatile matter and friability. The apparent specific gravity is of some value in classification as tests indicate that, of the coals sampled, the anthracites have a specific gravity of 1.40 and higher on the moisture and ash free basis, and the semi-anthracites run 1.40 and lower.

As a fixed boundary figure, the investigator suggests that coals over 92% carbon, moisture and ash free basis, be listed as anthracites and coals below this figure semi-anthracites. Coals between 91.5% and 92% are classified as anthracites if they do not yield tar in the standard closed-tube test. Coals not covered by this classification are very rare.

Complete Residential Cooling with Gas for 16 Cents an Hour



The Philadelphia Gas Works Company

Fig. 1. The Home of Controlled Climate conditioned with a gas-fired evaporative cooling system.

By EUGENE D. MILENER†

THAT a large residence can be air conditioned during the summer at an operating cost of 16 cents an hour was shown last summer in the "Home of Controlled Climate" in Pennsylvania. This building, which was sponsored as a model home by the Philadelphia Gas Works Company, contains the first residential installation of gas-fired air conditioning using the much-discussed evaporative cooling.

The apparatus furnishes automatic, year 'round air conditioning. It humidifies, heats, circulates, cleans, cools, and dehumidifies the air, thus fulfilling the six requirements of complete air conditioning. As shown in Fig. 2, the apparatus used during the summer is the same as that used during the winter except that the dehumidifier is substituted for the heater. This results in considerable saving in space and initial cost.

Method of Operation

The summer method of operation is shown clearly in Fig. 3. A portion of the return air from the building and the fresh outside air is drawn by a fan through the ducts and into the silica-gel dehumidifier where it is dried below the relative humidity needed for comfort. When the water vapor is removed from the air, the latent heat of vaporization given off heats the air. This heat is removed by passing the air through a small water cooler. From this partial cooler, the air passes into the evaporator or spray chamber where water is evaporated in order to cool it to the required temperature. The air is only partially saturated in the evaporator so that after it is mixed with the portion of return air that was not treated, the final humidity will be between 40% and 50%. The entire stream of the air is then forced by the main fan through the filter and distribution ducts to the room outlets.

When the apparatus was first installed, cooling was obtained by a combination of direct water coils and evaporative cooling. The success of the evaporative cooling was so pronounced, however, that the main water coils were removed and now entire dependence for cooling is placed on the evaporator. This has resulted in greatly reducing the amount of water and also in decreasing the electrical consumption of the fans. Less electricity is used because of the lower resistance of the system with the cooling coils removed. The gas consumption is increased, however, and this has to be taken into account when determining the method of

†American Gas Association.

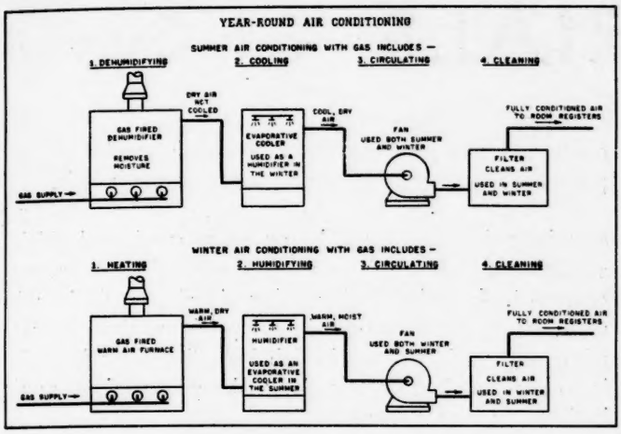


Fig. 2. Comparison of equipment needed for gas-fired conditioning in summer and in winter.

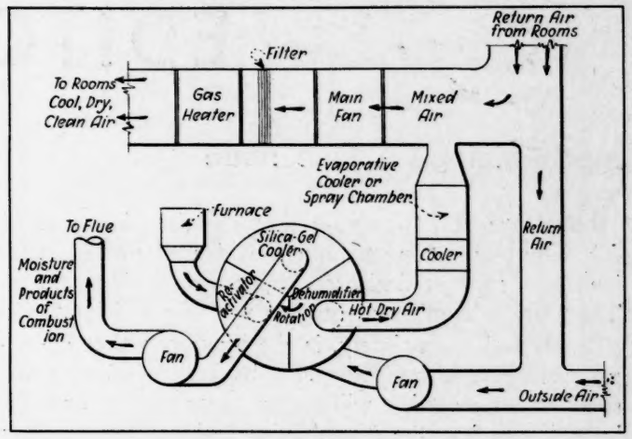


Fig. 3. Diagrammatic sketch of summer cooling system using a gas-fired silica-gel unit.

cooling. An important advantage is that limitations of air temperature, due to water temperature, are entirely removed and air temperatures well below the water temperature are readily available.

Building Construction

To keep the capacity and the operating costs of the air conditioning apparatus at a minimum, the building is thoroughly insulated and the windows are double-glazed. The exterior walls and the second floor ceiling are insulated with 1½ in. of cork with a 1-in. air space. In addition, rock wool is used in some places. All of the ductwork on the exterior walls is thoroughly insulated.

The entire building, having a total capacity of 21,130 cu. ft., is conditioned. The heat loss was calculated to be 162,000 B.t.u. per hr. without insulation and 113,000 B.t.u. per hr. with insulation. This shows a fuel saving of about 30% for the insulation and double glazing.

Cost of Operation

The cost of conditioning the residence from cellar to garret during the summer with gas dehydration and evaporative cooling is as follows:

For one full hour's operation—

180 cu. ft. of gas (535 B.t.u.) at 50c per 1000 cu. ft.	$0.09
1½ kw. at 3c per kw-hr.	0.05
6 gal. water per min. at 40c per 1000 cu. ft.	0.02
	$0.16

The above cost includes the entire cost of power for driving the air through the cleaners or filters and for circulating the air throughout the entire building.

The number of hours of full operation of the complete air conditioner during the summer depends entirely upon the family, but it is expected that it will be between 500 hr. and 750 hr. The season's cost for houses similar to this would therefore be between $80 and $120.

In localities where the cost of water is high, a small cooling tower can be used to eliminate the water in the small after-cooler. Inasmuch as the air entering the cooler has a temperature of between 125° and 150°, the water from a cooling tower will provide adequate cooling.

District Heat Included in Russian Soviet Plans

EXTENSIVE plans for heating Moscow by district steam appear to be part of the famed Second 5-Year Plan of the U.S.S.R. From accounts received from Moscow papers it appears that the central portion of Moscow is to be heated this coming winter from a district heating plant, which is reported as the largest in the world. Mention is made of a 25,000-kw. heating turbine to be placed in operation in October. It is to feed steam into 12 miles of pipe. Exact details of the plan are not obtainable, nor is it possible to check the correctness of the statement.

It seems that finally at the end of the Second 5-Year Plan in 1937 the Russians intend to heat practically all of Moscow from district plants. The figures mentioned are 200 miles of piping and 490,000 kw. of installed station capacity. This includes supplying industrial plants with steam as well as to have a heating service for Moscow buildings. Judging from the figures, it can be concluded that this plan must contemplate furnishing steam for practically every building in the Moscow district.

As a part of the general scheme throughout Russia combined heating and power plants are to be used in connection with hydro-electric power wherever possible. Statements made by B. Steklov, a Russian engineer, indicate that the intention is to use boilers for burning local Russian low-grade fuels and to do away with the necessity of importing the fuel.

EDITORIALS

Modernizing—A Live Issue

WE are of the opinion that the time has arrived for definitely getting behind the idea of modernizing, lending it support, and preparing to go into it seriously. There are a number of reasons for this decision.

First, and most timely, is the likelihood that an organized effort with Government backing will be started soon. If attempted, it will undoubtedly be accompanied by a heavy barrage of publicity and appeals to civic pride, by campaigns and committees and all the usual flare. It will serve to bring the idea forcefully home to every building owner as nothing has done before. There will be interest in the subject.

Then there is the improvement in general business and the better position occupied by real estate with some of its worst problems either solved or avoided. Only a few months back it was substantially hopeless to get anyone to do anything about modernizing no matter how much they agreed that it was needed. There is now much more of a notion that perhaps the world is not going so completely to pot that there is no use of putting in any new heating or ventilating equipment. The idea that there is some object in fixing the old place up is gaining ground, and so is the wherewithal to do it beginning to put in an appearance.

As strong a reason as any for advocating modernizing now lies in the wealth of new equipment available for accomplishing modernizing. Seeing the trend approaching, nearly all manufacturers have given thought to the kind of product which is useful in modernizing. Many have developed equipment of low unit cost and intended especially to appeal to the low unit sales which characterize this type of job. Beyond that whole new classes of equipment are now available which had no parallel even two or three years ago. Air conditioning equipment of the unit type is a case in point. Automatic firing of fuel was never so far advanced, never available at so low a cost, and never carried so powerful an appeal as at present. Not only can operating costs now be substantially lowered, but comfort can be obtained with less effort. Equipment is now also attractively finished. To go after modernizing work now we have a much stronger story to tell and products which carry real potential appeal far greater than was possible formerly.

To help all these favorable conditions, a technique is gradually developing. Enough pioneering at modernizing has been done to permit methods to be worked out and costs estimated in advance with some assurance of permitting the engineer to feel safe about his decisions and the contractor to get profitable work instead of having to merely hope that his price is right.

Added to all these is the fact that the inactivity of the past few years has undoubtedly piled up a huge amount of potential work in the shape of necessary repairs which have gone undone. Repair work can be converted into modernization as is shown by the experience of a sizable group who have gone into it.

Even when new construction starts it is virtually a certainty that there will be an amount of modernizing available which will be no small part of the total construction. It looks much as if modernizing will be with us for some time to come in such volume that the man who neglects it will be foolish indeed. The wise thing is to get into it now in order to be prepared when the ball really gets rolling.

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Back the Government Program!

LONG awaited for, the Administration program for stimulating private building by Government help has at last been brought out. It is by no means assured of passing for it is not yet anything but a proposal. There are even intimations that it will not be strongly pushed.

In the period since its announcement there has been a good deal of comment concerning it. Those in the general press range all the way from lukewarmness and doubts as to what it will accomplish, to enthusiastic approval. The special press interested in the construction industry has mainly hailed it as good. The Durable Goods Industries Committee which so strongly condemned certain phases of the recovery program has endorsed the plan in principle and asks support for it. Here and there have been expressions of disappointment that the plan did not go further. Some have commented that high cost is the real problem and not more credit.

As to the latter thought, it can be stated definitely that if building construction has to wait for substantially lowered costs the wait will be so long that most of us now living are not likely to see it. Everyone really close to the subject knows well that all proposals of special construction methods and materials for substantially lowering costs are not just around the corner. They have not one corner to turn but several.

So far as we can determine, the worst indictment brought against the plan is that it may not accomplish anything. Few, if any, have found anything really vicious about it.

Those who doubt its effectiveness are arguing before the fact and have little on which to base a judgment. It seems to us that it would be much more reasonable to lend support to help make the plan into a reality and then to judge its effectiveness afterward. We believe that all of us in this industry are fully justified in actively supporting the plan in its major points. We urge that you individually make your wishes known to your representatives in Congress. If the building industry gets solidly behind this plan it will pass even with only moderate support from the Administration. Whatever you do must be done at once.

Abstracts . . .

Reviews and Summaries of. . . . Current Papers, Books and Pamphlets

Mechanical Power Transmission

A voluminous book on the practical application of power transmission has been published by the American Leather Belting Association. The book is in the form of 50 reports and covers all types of drives, including V-belts, belting, chains, and gears.

Essentially this book is of a practical nature, dealing with the practical application of the methods of power transmission rather than with the theory of application. The fundamentals are not neglected, however, for they are covered in a clear and non-technical manner. The subject is then considered from the standpoint of design, maintenance, trouble elimination, and cost comparison over a wide range of conditions and applications.

Of particular interest are the reports on fan drives. Not only do they cover the methods of design and application, but also the methods of increasing the efficiency of fan systems. They explain how the dust formation on the sides of the ducts increases the resistance and so decreases the volume of air handled. Some other fan applications discussed are localized ventilation to remove mists and smokes, ventilation of large spaces, and blow-pipe systems.

Some of the other topics discussed are driven loads and how to belt them, motor and motor loads, comparison of short center drives, trouble jobs, modern group drives vs. individual drives, and efficiency of belt drives.

[*"Fifty Reports on Mechanical Power Transmission from Motor Drive to Industry," by Robert W. Drake; paper-bound;* 8½ *in.* × 11 *in.; 226 pages. Obtainable from American Leather Belting Association,* 41 *Park Row, New York; price,* 25*c.*]

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Elimination of Noise in Heating and Ventilating Systems

Heating and ventilating systems in the modern building must be constructed in such a manner as to be noiseless. To succeed in erecting such a system care has to be taken to fulfill certain basic conditions. In the elimination of noise an ounce of prevention has often been found to be worth more than a pound of cure.

There are three general principles involved in isolating machinery. The first of these is that the vibrating machine shall be mounted upon an elastic medium so that the free energy or vibration is dissipated in internal friction in the supporting medium, allowing the machine certain freedom of movement. The specifications for such a supporting medium are: permanent elasticity; capable of sustaining loads imposed upon it; not affected by oil or water; durable, and reasonable in price. Some of the materials satisfying these conditions are cork, felt, jute, and rubber. These materials may be used alone or in combination with each other.

The second principle is that the supporting elastic medium when under load must have a natural frequency below any frequency of the machine. If the frequency of the machine is lower than the natural frequency of the isolating medium the system will have little isolating value and vibration will be transmitted. For instance, if a machine having a frequency of 150 vibrations per minute is mounted on a medium having a natural frequency, under load, of 1500 vibrations per minute, the system will have practically no isolating value. The worst condition occurs when the foundation is in resonance with the machine. If a fan or pump running at 1200 r.p.m. is mounted on a natural cork in steel frame base which has a frequency of about 1200 vibrations per minute with a loading of 5 lb. per sq. in., the vibrations will be increased instead of decreased due to the two systems being in resonance.

The third principle is that in the case of high frequencies there shall be no direct metallic or rigid contact between the source of noise and the walls.

In the application of the above three principles to heating and ventilating systems much ingenuity can be used. When the fan of the ventilating system is on a roof or upper floor the following arrangement is recommended. The motor should not be directly connected to the motor shaft, but the drive should be a belt preferably of the V-type. The motor should be mounted upon a suitable number of anti-vibrators secured to a concrete slab which is isolated from the floor with 2½ in. cork in steel frames and felt ½ in. thick. The fan casing should be isolated at the base with cork and felt and the casing must not be in contact with the concrete slab or any part of the isolated foundation. The inlet and outlet ducts of this fan should have flexible lengths of light canvas inserted.

If the distance between the plenum fan and the ventilating outlets be short, the noise of the rotor of the fan can be reduced by leading the air into a large baffle box fitted with a number of baffle plates, each lined with a sound absorbing material. This box, which should have a large sectional area compared to the ducts, acts as a receiver and silencing chamber, the ducts leading from this chamber to the outlets in the theater.

[*"The Prevention of Vibration and Noise in Heating and Ventilating Systems," by Robert Grey. A paper delivered before the Institution of Heating and Ventilating Engineers, London. Heating and Ventilating Engineer (London), April,* 1934; 4 *pages; 2 illustrations.*]

A New Book on Ventilation

Ventilation is usually treated in textbooks as a secondary subject to heating, inasmuch as it is difficult entirely to separate them. An English author has just published a book devoted to ventilation only, and written for the student, draftsman, and architect, rather than the experienced ventilating engineer. The chapters include those on atmospheric air, natural ventilation, design of air ducts, fans and fan testing, ventilation combined with heating, and air conditioning.

Since the book is primarily a textbook, and therefore confined somewhat more to principles rather than practice, the difference between British and American practice does not detract from the value of the work. The chapter on fans is particularly good, although the material on air conditioning is somewhat sketchy, probably due to the fact that the British have not paid a great deal of attention to this subject, except for industrial application. On the whole, however, Mr. Joselin's volume is to be recommended, particularly for those who have a slight knowledge, and desire greater knowledge, of ventilating.

[*"Ventilation," by E. L. Joselin, Lecturer on Heating and Ventilation, Borough Polytechnic, London; cloth-bound; 6 in. × 9¼ in.; 238 pages; price, $5.75. Obtainable from Longmans-Green & Co., 55 Fifth Ave., New York.*]

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Development of Quiet Propeller Fans

The recent development of air conditioning apparatus has intensified research on fans. One of the problems encountered in the application of fans to air conditioning was the elimination of the noise. Fans designed for high efficiency and otherwise good performance were useless because of the noise made by them.

Because of its simplicity and wide applicability to air conditioning apparatus, the propeller fan was chosen for research work on the cause of noises. It was discovered that noise in any propeller fan depends upon two factors: first, the maximum axial velocity of the discharge air stream and, second, the effective width of the blade. The noise is proportional to the square root of the maximum acceleration of the air as it passes through the fan regardless of speed, diameter, pitch angle (between 10° and 40°), blade shape, number of blades, or blade width.

A contributing cause of noise of lesser importance involved the shape of the peripheral edge of the blade. Air either entering or leaving the peripheral edge of the blade between the leading and trailing edges causes the familiar whine which is very objectionable but does not appreciably affect the total noise.

Several other factors, outside of the fan, cause noise. Obstructions near the fan, improper duct shapes, and motor noise radiation through the fan blades in many instances result in noise.

Requirements for ideal operation of propeller fans are:

1.—The low velocity at the center of the fan should be increased.

2.—Contraction of the air stream should be eliminated.

3.—Effective width of the blade should be as great as possible.

4.—Curvature of the blade should be such as to produce uniform acceleration over its entire width.

5.—The peripheral edge of the blade should be shaped so that the air neither enters or leaves the blade between its leading and trailing edges.

Included in the paper is a chart for the determination of the characteristics of a fan for a given system. Six characteristics are plotted on the chart: fan diameter, static pressure, air flow, speed, noise, and horsepower. If any two of the above are known, the other four can be determined. For instance, if the air flow and noise maximum are known, the static pressure, fan diameter, speed, and horsepower can be determined.

[*"The Development of Quiet Propeller Fans," by K. McMahan, General Electric Review, February, 1934; approximately 4500 words; 4 graphs; 3 illustrations.*]

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Prevention of Boiler Scale

This paper formulates a theory for the deposit of calcium sulphate scale in steam boilers developing pressures up to 2000 lb. per sq. in. Previous work on this subject had been done with pressures up to only 225 lb. per sq. in. Because of this, there were discrepancies between theory and practice on the amount of scale formation in high-pressure boilers.

[*"The Cause and Prevention of Calcium Sulphate Scale in Steam Boilers," by Frederick G. Straub. Bulletin No. 261; published by Engineering Experiment Station, University of Illinois, Urbana, Ill.; price, 85 cents; 75 pages, 6 in. × 9 in.*]

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Thermostats

The purpose of this book is to gather into one volume descriptions of the various types of thermostats which have been scattered over a wide range of scientific periodicals. It is intended that the volume will give not only information on thermostats but also will help in the selection of the right one for the job.

Since the volume attempts to cover practically the entire field of heat control, the space devoted to instruments for controlling the temperature in buildings is small. The book is to be recommended, however, for the lucid explanations and excellent diagrams of the basic types of thermostats. Anyone wishing to obtain knowledge of the theory of these instruments will do well to read this volume.

A short description of relays and control valves is given in the appendix.

[*"Thermostats and Temperature Regulating Instruments," by Roosevelt Griffiths; cloth-bound; 6 in. × 9 in.; 153 pages; 88 illustrations. Published in England, but obtainable from J. B. Lippincott Co., Philadelphia.*]

NEWS OF THE MONTH

Code Authorities Recognized

WASHINGTON — NRA Administrator Hugh S. Johnson announced May 25 that he had approved the method of selection and recognized the personnel of code authorities for the unit heater and for the convector industries.

Members of the code authority for the Non-Ferrous and Steel Convectors Manufacturing Industry are: Reuben N. Trane, The Trane Company; M. S. Dillman, American Radiator Company; A. G. Dixon, Modine Manufacturing Company, and L. O. Mandell, C. A. Dunham Company.

The code authority for the Unit Heater and Unit Ventilator Manufacturing Industry consists of J. I. Lyle, Carrier Engineering Corporation; G. E. Otis, The Herman Nelson Corporation; J. F. G. Miller, B. F. Sturtevant Company, and R. J. Tenkonohy, Airtherm Manufacturing Company.

Homer Linn on Research Committee

NEW YORK—Homer R. Linn, American Radiator Company, is one of the members of the newly-announced personnel of the Coal Divisions Committee for Bituminous Research Planning, according to the announcement by N. G. Alford, secretary of the coal division, American Institute of Mining and Metallurgical Engineers. Other members are: E. G. Bailey, S. P. Burke, John C. Cosgrove, W. G. Duncan, Jr., A. C. Fieldner, A. W. Gauger, C. B. Huntress, David Ingle, Wm. Emery, Jr., H. H. Lowry, Eugene McAuliffe, D. R. Mitchell, J. B. Morrow, Jas. H. Pierce, C. M. Smith, F. G. Tryon, C. E. Williams, H. F. Yancey, and L. E. Young. Eli T. Connor and Mr. Alford are ex-officio members.

Mr. Linn will represent the Institute of Boiler & Radiator Manufacturers. The purpose of the Committee is to develop a long-term plan for research on bituminous coal.

Plumbing Code Approved

WASHINGTON—Fair practice codes of the divisional groups of the Construction Industry are slowly receiving approval. President Roosevelt signed the code governing plumbing sub-contractors May 16.

Following submission of a code for the building contractors, known as Chapter 2-A of the Construction Industry, a public hearing was called by Administrator Johnson for May 21. With the completion of the hearing final approval of this important Chapter is expected promptly.

Plans Filed for N. Y. Skyscraper

NEW YORK—Plans for three more buildings in the Rockefeller Center midtown amusement and commercial development were filed May 8 with the Manhattan Department of Buildings. The buildings are a 38-story office skyscraper and twin seven-story edifices planned for the Fifth Avenue block-front between 50th and 51st Streets, the northerly block of the development. The site already has been excavated. The cost of the group was estimated at $8 million.

Our 30th Birthday

With this issue HEATING AND VENTILATING completes its 30th year of editorial service to its readers. Since the appearance of the first issue in June, 1904, the constant object of its whole staff has been to increase its usefulness to its readers and to promote the best interests of everyone connected with the heating, ventilating, and air conditioning industry. We start our 31st year with the firm determination to continually improve our service to you in order that we may keep on meriting your long-sustained confidence.

Detroit A.S.H.V.E. Has Annual Meeting

DETROIT—The annual meeting of the Michigan Chapter, A.S.H.V.E., was held May 16 with approximately 60 members present. The meeting was held following an afternoon of golf and baseball at the Meadowbrook Golf Club.

Officers elected for the coming year were as follows: president, G. D. Winans; vice-president, A. C. Wallich; treasurer, R. K. Milward; secretary, W. F. Arnoldy. Board of Governors: H. E. Paetz, Edward Glanz, John Kilner and Frank Feeley.

Anthracite Laboratory Issues New Reports

PRIMOS, PA.—Newly-released reports by the Anthracite Institute Laboratory cover tests on a magazine boiler conducted at the request of the Quartermaster Corps of the U. S. Army to aid them in selecting equipment for Army posts; a description of a proposed new magazine boiler to burn chestnut size of anthracite; a new thermostat having a novel device for periodically "feeling" or anticipating changes in room temperature, and one describing a combination of coke and anthracite sold in Philadelphia under the trade name of Kokowheat.

Arrangements have been completed to release reports of the Institute's Division of Scientific Research through the Anthracite Institute Laboratory.

Alpine Tunnel to be Cooled

PARIS—An air conditioned vehicular tunnel has been proposed to cut under Mont Blanc. Such a tunnel would be about 12½ kilometers long, and would be the first of its kind to pierce the Alps.

Air conditioning has been the problem that has presented the greatest difficulties. It was not found practicable to undertake a tunnel which would traverse the mountain at its base, so that a road of approach would be constructed climbing some 160 meters above Chamonix railway station to the point of entry of the tunnel. But even at this altitude the interior of the mountain is too warm. It is estimated that air conditioning can be accomplished with fair success if the temperature below the surface does not exceed 95°. The temperature in this tunnel, however, it is estimated, will for a certain distance attain 101°, but technicians believe they can overcome this objection.

Bailey M. E. Head at Iowa State

AMES, IOWA—Prof. Neil P. Bailey, mechanical engineering staff, University of North Carolina, Chapel Hill, N. C., has been appointed head and professor of the Mechanical Engineering Department, Iowa State College, Ames, Iowa. Professor Bailey, 33 years old, is the youngest department head ever appointed at Iowa State College.

During 9 years of teaching and research Professor Bailey has specialized in thermodynamics, heat flow, aerodynamics, and fluid mechanics. He replaces Prof. Warren H. Meeker.

Heating and Piping Contractors Discuss Codes and Rules of Bidding at Annual Convention at Atlantic City

ATLANTIC CITY—Discussions of the NRA Codes and adjustment of the contractor's business to changing conditions featured the 45th annual convention of the Heating, Piping and Air Conditioning Contractors National Association, at the Hotel Ambassador May 19-25. Although the attendance was small, interest ran high and papers presented were of high quality.

The convention was welcomed to New Jersey by Harry Geiser, secretary of the North Jersey Association, and by a representative of Mayor Harry A. Bachrach. President Robert D. Williams in the President's Address reviewed the accomplishments of the Association during the past year and spoke highly of the cooperation given him by his fellow officers.

Major R. M. Campbell, representing NRA, addressed the convention on "The National Recovery Program." He predicted that the various chapters of the construction code would be rapidly approved and said that the code for the Heating and Piping Contractors is now in the hands of the Review Board.

In his report, Secretary J. C. Fitts said that the heating and piping code provides for a code authority of 10 men, seven to be members of the Heating, Piping and Air Conditioning Contractors National Association. For purposes of administration the country will be divided into 11 regions in each of which a committee will be established whose function will be to aid the Code Authority in organizing state committees and local committees and in obtaining compliance on the part of the industry with the code.

Mr. Fitts said that the rules of bidding required by NRA codes were one of the greatest advances made by the construction industry in years.

John Coefield, president of the United Association of Journeymen Plumbers and Steam Fitters, in his address on "Labor and the Recovery Program," said that there was less petty quarreling between employers and employes in the heating and piping code discussion than in any of the industries sponsoring codes.

The possibility that within the next five years there will be a shortage of adequately skilled mechanics in the heating industry was suggested by Dr. S. Lewis Land in his report as educational director. This Doctor Land explained as due to the fact that many skilled mechanics have left the industry on account of unemployment, others have lost old skills, and new skills, such as welding, have been entered into in the meantime. He believed that plans should be made locally on the part of contractors and journeymen for the training of young men to supply the needs of the future. He said that piping and welding classes started in previous years had been continued, together with other courses started last fall. Three courses were conducted last summer.

Stephen F. Voorhees, chairman of the Construction Code Authority, addressed the convention on "The Construction Code and Its Administration," while Prof. A. P. Kratz of the University of Illinois gave a talk on "Radiators and Convectors."

"Air Conditioning in 1934" was discussed by Willis H. Carrier. Mr. Carrier predicted that we shall soon find entire apartment houses, hotels, offices, hospitals, and all kinds of public buildings provided with conditioned air. He predicted that the home of the future will be heated largely by air warmed by gas or oil-fired furnaces and the warmed conditioned air distributed by noiseless fans. He believed that it will soon be possible to press a button and place the house-heating system in operation under automatic control and to do the same with the cooling system.

In the report of the committee on air conditioning J. Lawrence DeNeille said that the committee is at the present time preparing supplementary material on mechanical refrigeration. A series of three lessons on water cooling by steam or ice will be published in August.

John H. Zink, chairman of the Committee on Welding, presented the report of that committee and said that the greater part of his committee's work during the past year had been in standardizing welding fittings and the preparation of the welding code for pressure piping.

Harry M. Hart, chairman of the subcommittee on boiler output, spoke of the present method of arriving at the net load recommendations. These have been criticized, he said, because they did not give any credit for the amount of heating surface in the boilers. Mr. Hart said: "It is true that we have ignored heating surface in our recommendations for coal-fired cast-iron boilers and this was for two reasons:

"First, the difficulty of arriving at an equitable method of measuring the actual effective heating surface in such boilers.

"Second, because of the doubtful value of heating surface as a true measure of boiler performance.

"The reason for this is the wide range of output that a heating boiler is called upon to produce in actual practice."

In addition, Mr. Hart said that some manufacturers have deviated from the recognized firepot design in order to gain a higher net load recommendation by widening the firepot at the grate line, especially in the smaller type boiler. Commenting on this, Mr. Hart said:

"In order to discourage this practice we have decided to base our recommendations for the small size sectional boilers on the width of the firepot at a point 9 in. above the grate line instead of at the grate line.

"A careful comparison of these small boilers when the Net Load Recommendations are calculated on this basis discloses the fact that for the same Net Load Recommendations some boilers are considerably larger than others, so the manufacturer of the larger boilers immediately comes to the conclusion that he is being discriminated against.

"In so far as results are concerned in actual practice this is questionable; but in so far as competition is concerned we will have to acknowledge that this is so.

"So in order to overcome this objection on the part of the manufacturer we have decided to credit or debit the Net Load Recommendations resulting from using the firepot width 9 in. above the grate line in direct proportion as the difference between the ratio of Net Load to Volume of each boiler differs from the average ratio of Net Load to Volume of all the boilers listed in our booklet."

William J. Olvany, of the eastern division of the Membership Committee, reported that 156 new members had been added in the East. A slow but steady gain in membership was reported by Paul E. Werner, chairman of the western division, while Maurice J. Chagnard, of Louisville, chairman of the central division, reported a gain of 80 members.

In the report of the Committee on Trade Promotion, Walter Klie, chairman, reviewed the modernization situation and referred to the National Housing Act under consideration in Washington, and to the Real Property Inventory, preliminary figures for which are now available.

In planning a local program for the promotion of modernizing Mr. Klie said:

"First, make use of the existing trade organization machinery in your community for the organization and development of this modernization program.

"In the case of a local association whose entire membership is not interested in active participation in a local modernization drive, those members who are interested should organize themselves into a special section to formulate this program and to carry forward the work.

"Second, provide a plan for cooperation and coordination of all of the interests in the Construction Industry, including Government and civic organizations.

"Third, provide a plan for the coordination of local effort in selling

modernization and for adequate follow-up of contacts which are established.

"Fourth, make specific provision for the adequate financing of your local program, both for the organization and development of the program and for the handling of time payment paper for modernization work."

In closing, Mr. Klie called to the attention of members the distribution policies of certain manufacturers many of whom are selling through channels other than the heating contractor. Mr. Klie believed that this was due to these companies not having made a full study of the distribution policies in the heating and air conditioning field, and said that one way to partially eliminate these difficulties would be for heating contractors to do such an excellent job in retailing of air conditioning equipment that they would be recognized as the best possible channel for disposing of such equipment.

"Selling Modernization in 1934" was the subject of a talk by John L. Campbell, assistant sales manager of American Radiator Company, who pointed out the tremendous opportunities in modernizing as shown by the Real Property Inventory.

Russell G. Creviston, sales promotion manager of Crane Company, divided his talk into four parts. First, the effect which the New Deal has had on general business; second, the effect the New Deal has had on distribution; third, the economic and social advantages of the New Deal, and fourth, what can be done to stimulate business in the near future. Mr. Creviston believed that NRA has had a rather negative effect on general business due to the concern which executives have felt over their immediate problems of price raising, increasing wages, etc. He stressed the fact that there is no profit in staple goods and that it would be necessary for manufacturers in the future to be more concerned with trademarking their products, making specialties out of their services or commodities, and similar trends. He suggested that contractors consult professional accountants in their bookkeeping methods and predicted that selling in the future would be on a higher plane. Although the government is interested in housing, he said it is not so much interested in housing as work for the building industry as it is to obtain proper living quarters for the masses, and said that the housing authorities need the help and guidance of the heating industry.

E. L. Sylvester, Delco Appliance Corporation, spoke on "The Heating Contractor and the Merchandising of Automatic Heating Equipment." Mr. Sylvester said that he believed that the oil burner industry was turning more and more to the contractor as a sales outlet and that it was up to the contractors to strengthen their position in this regard; that the contractor was the logical man for the installation of heating equipment, provided he brought his method of distribution up to date.

J. Lawrence DeNeille was elected president of the association; John H. Zink was elected vice-president, and Maurice J. Chagnard was elected treasurer for the coming year.

Norfolk Hospital Praises Air Conditioning

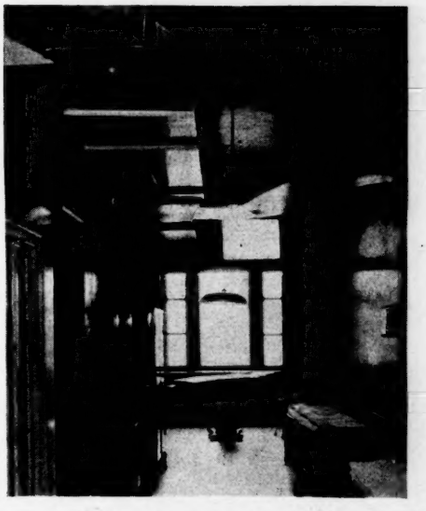
NORFOLK—Air conditioning is helpful to patients undergoing an operation, observations at the Norfolk Protestant Hospital have shown. Patients withstand the surgical shock better and rally far more quickly when the room is kept at a comfortable temperature and humidity.

Since the installation of air conditioning equipment a little more than a year ago, Ruth B. Epperson, who is in charge of the operating room, has been making a careful study of surgical patients, noting their condition while under the influence of anaesthesia and then the effect after they have recovered consciousness. She has been particularly interested in the use of air conditioning because she was convinced that the enervating atmosphere encountered during the summer was sapping the vitality of patients and lowering their chances for a successful operation and a speedy recovery.

The surgery of this hospital consists of three rooms, with a central hall leading into one room, and the other rooms on each side of the hall. A duct system was installed with a remotely-located compressor.

"The air conditioning equipment added to the comfort of the doctors and nurses during their work, and it had a marked effect on the condition of the patient throughout the operation due to the lowered humidity," says Miss Epperson. "In addition, we notice that it clears up any odors that may accompany an operation. Since installing this equipment, we have noted a greater degree of efficiency on the part of those working in the operating rooms, due to the increased comfort. During the warm summer months, we were able to maintain a temperature difference of at least 12° on an average.

"We use the air conditioning unit even during the winter months in order to bring the rooms down to the proper temperature quickly. The temperature of an operating room should be between 70° and 80°. Oftentimes, it will mount above this, but with the air conditioning unit turned on, this can be remedied in short notice."



Frigidaire conditioning system in Virginia hospital

Jersey Fuel Dealers Continue Under State Code

NEWARK—Representatives of the retail fuel oil industry voted May 3 to continue under a state code. The vote was 162 to 10. On the same ballot the industry elected a code authority of 15 members.

The vote, the first on whether a state code should be cancelled, was conducted under the supervision of the State Recovery Administration. A committee of eight members of the industry tabulated the vote. After certifying the vote, the committee adopted a resolution urging that Harry A. Tooker and Morris Zientz be appointed to the code authority by Governor Moore. The Governor will select two members of the industry to serve.

Differences arose in the industry over the administration of the code some weeks ago. In the industry are several dealers who handle both coal and oil. The dealers whose business was confined to oil took the attitude they did not want the code administration dominated by the dual dealers. Under the new authority there will be eight representatives who handle oil and seven dual dealers.

Free Fuel Cost Charts

CHICAGO—A chart suitable for wall use and showing comparative costs of coal, oil, and gas for steam raising has been published by Lammert & Mann Company, Wood and Walnut Streets, this city. The charts show the cost per 1000 lb. of water evaporated at various efficiencies and for various fuel costs. The information can also be supplied on request for standard 8½ x 11 in. looseleaf binders.

District Heating Engineers Prepare for Twenty-Fifth Annual Convention at Rochester

ROCHESTER—The 25th annual convention of the National District Heating Association will be held at the Sagamore Hotel here June 12-14. J. E. Hillemeyer, president of the Association, will preside at the opening session on the morning of June 12, during which Herman Russell, president of the Rochester Gas & Electric Corporation, will welcome the convention to this city.

The program follows:

JUNE 12—MORNING

J. E. Hillemeyer, presiding.
Welcome—Herman Russell, president, Rochester Gas & Electric Corporation.
Response—Wm. J. Baldwin, Jr., first vice-president, N.D.H.A.
President's address—J. E. Hillemeyer.
Report of Secretary-Treasurer—D. C. Gaskill.
Appointment of Nominating Committee—J. E. Hillemeyer.
Report of Educational Committee (D. S. Boyden, chairman):
- New subjects for the Handbook—J. C. Butler.
- Publicity for district heating—L. S. Smith.
- Course on district heating—Wm. J. Baldwin, Jr.
- Index of technical material on district heating—W. W. Stevenson.
- Advertising in the Bulletin and Proceedings—D. S. Boyden.

Report of Membership Committee—(H. C. Kimbrough, chairman).
Report of Publication Committee—(M. D. Engle, chairman).

JUNE 12—AFTERNOON

Wm. J. Baldwin, Jr., presiding.
Report of Rates and Regulations Committee (W. A. Hunter, chairman).
- Demand Rates and Their Application—S. S. Sanford.
- Off-peak or Summer Rates and Their Need—J. C. Butler.
- Forms of Steam Contracts—Chas. Myers.

Report of Research Committee—(G. K. Saurwein, chairman).
Report of Corrosion Committee—(J. H. Walker, chairman).
- Study and Further Report of Corrosion of Pipes—J. H. Walker.
- Reducing Valves—J. F. Malone.
- Comparison of Steam Flow Formulas—C. R. Erickson.

Report of Meters Committee—(E. A. Lueky, chairman).
- Load and Load Factors in Connection with Metering—W. W. Stevenson.
- Test Data on the Isometer, Shunt Meter and Late Type Bailey Meter—H. Warhanek.
- Effect on Flow Meter Accuracy of Pulsations in Steam Lines Caused by Reducing Valves and Temperature Regulators—L. D. Gray.
- Design of Orifices, Nozzles and Venturi Tubes as Primary Elements of Steam Flow Meters—A. A. Markson.
- Minimum Number of Readings per Month on Condensation Meters to Maintain Accurate Metering—E. A. Lueky.
- Steam Meter Inspectors' Equipment—C. Erickson.
- Comparison Check of Flow Meters and Condensation Meters on Customer's Premises—C. Renker.

JUNE 12—EVENING

M. D. Engle, presiding.
Report of Hot Water Committee—(F. L. Witsell, chairman).
- Treatment of Make-Up Added to Hot Water Heating Systems—A. W. Wieters.
- Hot Water Heating in 60 Wall Tower, New York—L. S. Phillips
- Selling Effort in Maintaining Present Hot Water Heating Service Business—C. L. Johnson.
- European Hot Water Heating Practice—F. L. Witsell.

Report of Operating Statistics Committee—A. D. Leach, chairman.

JUNE 13—BREAKFAST SESSION

Rates and Regulations—W. A. Hunter, presiding.
Meters—E. A. Lueky, presiding.

JUNE 13—MORNING

J. E. Hillemeyer, presiding.
Report of Commercial Relations Committee—(R. L. Fitzgerald, chairman).
- Economic Advantage of Economizers—A. D. Leach.
- Standard Methods of Determining Building Volume—R. L. Fitzgerald.
- Variation of Degree-Day Base for Different Parts of the Heating Season—W. C. Kaber.
- Experience with One Pipe Heating System with Modern Control—F. Lee Rapson.
- Recent Developments in Temperature Control—D. Loucks.

Report of Sales Development Committee (J. E. Seiter, chairman).
- General Utility Sales Methods—Robin Bell.
- Advertising—J. M. Arthur.
- Meeting Stoker, Oil Burner and Private Plant Competition—R. J. J. Tennant.
- Methods of Getting New Business—R. D. Martin.
- Commercial Control Equipment—S. S. Sanford.

JUNE 14—BREAKFAST SESSION

Sales Development Committee—J. Earl Seiter, presiding.
Commercial Relations Committee—R. L. Fitzgerald, presiding.

JUNE 14—MORNING

R. L. Fitzgerald, presiding.
Steam Station Engineering Committee (J. R. McCausland, Jr., chairman).
- Laying Up Boilers for Extended Periods of Time—Harold Farmer.
- High Temperature Cements and Plastic Coverings—N. S. Wade.
- Operating Manual as Adjunct in Training Plant Employes—R. G. Felger.

Report of Distribution Committee (J. F. Collins, Jr., chairman).
- Expansion Joints—L. D. Gray.
- Manhole Frames and Covers—G. D. Winans.
- Expansion Joints for Steam Conduits and Tunnels—Raymond Nee.
- Distribution Line Losses and Unaccounted-for Steam—Edw. Lenz.
- Supplementary Data on Soil Temperature Adjacent to a 16-in. Steam Line—W. A. Herr.

JUNE 15—BREAKFAST SESSION

Distribution Committee—J. F. Collins, Jr., presiding.
Steam Station Engineering—J. R. McCausland, Jr., presiding.

JUNE 15—MORNING

J. E. Hillemeyer, presiding.
Report of Nominating Committee.
Election of Officers.
Reports of Resolutions Committee.
Open Discussion.
Manufacturers' Round Table.
Installation of Officers.

O. B. Firm Incorporates

ST. LOUIS—The International Oil Burner & Manufacturing Company, Sol Wolff, president, has incorporated to take over the good will and part of the assets of the International Oil Heating Company, which recently went into bankruptcy. The company at present employs 20 persons and occupies 26,000 sq. ft. of floor space.

The International Oil Burner Company has been incorporated to serve as a sales unit for the manufacturing company.

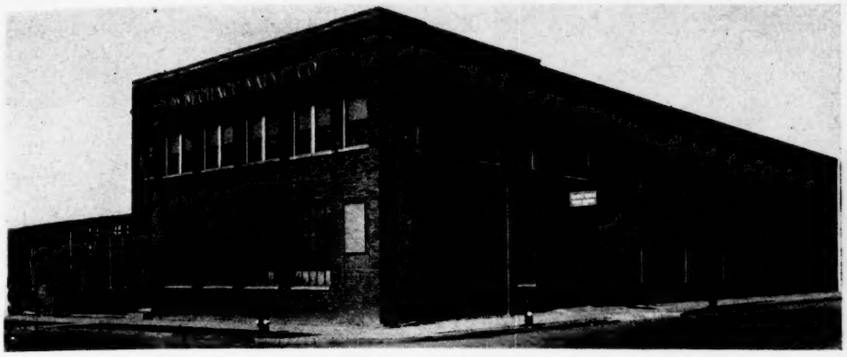
G. E. Conditioning for New Haven Cars

SCHENECTADY—Fifty new de luxe light-weight streamlined coaches of the New Haven Railroad are to be supplied with General Electric air conditioning equipment. Each car will use a single-unit evaporator consisting of heating and cooling coils, with blower fans and motors, which will furnish conditioned air through a center duct extending the length of the car.

The compressor-condenser unit, driven by a direct-current motor, will be mounted underneath the car. Control will be of the combined heating and cooling type. Power will be supplied by 20-kw., gear-driven, axle-mounted generators.

Delco Included in G.M. Exhibits

ROCHESTER, N. Y.—Delco Appliance Corporation will provide space for its distributors in 21 of the "National Exhibits—General Motors Products," which will be held June 2-9 in 61 cities. The Delco-Heat Harmonized boiler will be presented in halls draped in green and silver.



Factory of W. M. Chace Valve Company and addition under construction

Chace Builds Addition to Plant

DETROIT—W. M. Chace Valve Company has started construction of a new addition to its present quarters. Located on Beard Avenue, the plant, when addition is completed, will have over 19,000 sq. ft. of floor space. The new quarters will be almost entirely utilized by the thermostatic bimetal division of the business.

Building Active in Alaska

SEATTLE—Rice and Ahlers Co., Juneau, Alaska, has been awarded the contract for the installation of a ventilation system and oil burners in the Pioneer's Home now under construction at Sitka, Alaska. This building is one of a number of enterprises under way resulting from the great rush of business activity in the gold fields.

Bon-Air Purchases Concealed Radiation Corp.

BOSTON—Purchase of the Concealed Radiation Corp., Bridgeport, Conn., by the Bon-Air Radiator Corp., Boston, has been announced by C. Arnold Hall, president of Bon-Air. By the terms of the purchase, Bon-Air takes over all assets of the Concealed Radiation Corporation. All machinery and equipment is being moved from the plant of the Bridgeport Brass Co., Bridgeport, to the Bon-Air plant at Somerville, Mass.

The purchase enables Bon-Air to offer a new and improved type of radiator, either as separate equipment or as part of the Bon-Air air conditioning systems which have recently been put on the market, Mr. Hall stated. It also enables Bon-Air to do fin-winding of copper tubes for the radiation and heating equipment of other manufacturers.

The new radiator has been developed under the name of Concora. It is a copper radiator, with a heavy rectangular copper core and closely spaced, tin-coated copper fins metallically bonded to the core.

Boston A.C. Bureau Hears McLenegan

BOSTON—At the regular monthly meeting of the Air Conditioning Bureau of Boston, held April 26, it was voted to hold during June an exposition of air conditioning equipment on the second floor of the Edison Building. Because of the expense involved, none of the equipment will be operated.

It was voted that all air conditioning installations be reported to the secretary of the Bureau, who is to classify them according to the functions of air conditioning as defined by the Bureau's by-laws.

David McLenegan, assistant chief engineer of the Air Conditioning Division, General Electric Company, was the speaker of the evening, and talked on "Air Conditioning as General Electric Company Sees It," together with an account of some of the difficulties encountered by utility companies in placing air conditioning equipment on their lines.

Byrnes Starts Own Firm

DETROIT—H. Kelley & Company, heating and piping contractors with headquarters in Minneapolis and branches in a number of cities, has discontinued its Detroit branch office.

Emmett Byrnes, who has been manager of the Detroit office, will enter the heating and piping contracting business under his own name with headquarters in the former Kelley offices at 609 Free Press Building.

Oil Burner Assessments Criticized at Hearing

(Continued from page 57)

lished in various newspapers, stating that the Code Authority was engaged in racketeering. This inference was due to the fact that, on the same day the hearing was held, General Johnson, in a press conference, stated that code administration expenditures were one of the things he intended to watch—that they constituted great danger in the way of racketeering and oppression. The report of this press conference was published in the same item with the report covering the oil burner hearing, and it was possible to infer that the Authority was being referred to by General Johnson. This led Mr. Hammers to make a public statement as follows:

"Following the hearing of May 8, newspaper accounts of the proceedings indicated that the legality of the procedures in connection with the Code Authority's collection and disbursements of levy assessments has been challenged by NRA.

"The collection of levies and the procedures adopted by the Code Authority were approved for the Administrator by the Deputy Administrator who had been assigned to the Oil Burner Code as the Administrator's representative. We have been advised by our counsel that this approval was an approval by the Administrator in accordance with the law and we have also been advised that this has been the legal opinion of the Legal Division of NRA. All levies collected by the Code Authority have been recorded with the Deputy Administrator, and in addition the Code Authority has filed a record of every disbursement that has been made. This information was filed with NRA prior to the public hearing of May 8.

"In keeping with sound business practice, the Code Authority has in all matters pertaining to the Code acted in good faith, keeping in mind the trust imposed upon them by the industry—and on the basis of instructions received from the Deputy Administrator originally assigned to the Code.

"At the January meeting of the Code Authority the compensation of the Chairman for all his Code services, past, present, and future, was fixed at $9,150 and made a matter of record with the National Recovery Administration at that time. This amount and no more has been paid, as recorded in the budget on file with the NRA. The last payment was made as of March 31, 1934. No further compensation of any kind was contemplated or provided for in the budget, although he has rendered full-time services to the Code Authority from October 1, 1933 to date.

"The Code Authority has nothing to conceal and has filed complete information as to all of its activities with the National Recovery Administration at regular intervals."

AOBA Directors Discuss Gas Competition

NEW YORK—A special joint meeting of the directorates of the American Oil Burner Association and the Distillate Burner Manufacturers Association was held at Hotel Biltmore May 7 to consider the condition now facing the oil burner industry with respect to what is deemed as unfair competition from the gas industry, and also to review the code problems confronting the oil burner industry.

R. M. Sherman, president of the A.O.B.A., who announced his resignation from the Oil Burner Code Authority for the expressed reason that he would be able to give full time to the gas problem, stated that the program of the Association will include solidifying the industry in a drive to carry the facts of the alleged unfair competitive methods used by the gas industry to the public and to municipal, state, and federal authorities having jurisdiction.

C. J. Bassler, Chicago, chairman of the special committee on gas competition, stated that subsequent to the advertising and merchandising campaign by the utilities there, about 30% of the installations put into homes by the gas companies last summer had been removed already because of unanticipated costs of heating with gas.

"Because no action has been forthcoming from the NRA with respect to unfair competition on the part of the gas industry and because the oil heating industry is looking toward its biggest sales year," Mr. Sherman said, "the Association proposes no further delay in its plain duty to protect the interests of all oil burner dealers in territories affected by gas competition.

"Despite the fact that the Oil Burner Code Authority entered a complete and official bill of particulars last January 3 at a public hearing in Washington on the natural gas code, nothing has been done by the administration to correct a most unequitable situation existing between the natural gas code, on the one hand, and the oil burner code, on the other," he continued. "In the meantime, the utilities have continued to employ misleading advertising and to engage in unethical and unfair merchandising practices not permitted the oil burner industry under its code of fair competition."

Headed by Mr. Bassler as chairman, the special committee on gas competition is comprised of A. J. Fleischmann, vice-chairman, and R. S. Bohn, vice-chairman. In addition the following subcommittees were appointed: (Representing Manufacturers) A. J. Fleischmann, E. A. Halbleib, Morgan J. Hammers, S. C. Hope, M. A. Powers; (Representing Dealers) R. S. Bohn, New York; Ray Porter, Minneapolis; W. F. Schroeder, St. Louis; John W. Scott, Boston; and C. W. Whitney, Philadelphia.

Those representing the A.O.B.A. at the meeting were the following: R. M. Sherman, Morgan J. Hammers, E. P. Bailey, Milton A. Powers, J. J. Donovan, Earl Marr, E. A. Halbleib, A. J. Fleischmann, R. S. Bohn, W. F. Schroeder, John W. Scott, A. G. Baerenklau, C. J. Bassler, Harry F. Tapp, Arthur W. Clark, C. A. Ott, and Carl Shields. Those representing the Distillate Burner Manufacturers Association were the following: H. H. Morse, E. T. Adams, G. F. Williams.

M. J. Hammers, chairman of the Oil Burner Code Authority, reviewed code activities from March 5 to date. Following his recital there was a general discussion of code problems by all present.

British Establish 60° for Degree-Day

LONDON—British heating engineers have developed a unit equivalent to the American degree-day unit, but unlike the American unit, which is based on a 65° temperature, the British unit is predicated on the idea that heat will not be called for unless the daily mean temperature falls below 60°. The average number of such degree-days for England is about 4200.

Subcontractors Group Changes Name

DETROIT—At a meeting of the directors of the Michigan Society of Building Crafts April 27 it was decided to change the name of the organization, which links together 14 separate subcontractors' organizations having to do with the building trades, to the Subcontractors' Michigan Association, Inc., as being more representative of the membership of the association. It was decided to incorporate under the new name as soon as possible.

The annual meeting was set for May and officers and directors to conduct the affairs of the association will be selected at that session. Another innovation will be the admission of outstate subcontractors to the organization, which has been confined almost entirely to Detroit firms in the past.

Among the subcontractors' associations affiliated with this central organization are those of the heating and piping, sheet metal, and plumbing trades. George Clarke, executive secretary of the Heating & Piping Contractors Detroit Association, is secretary-treasurer and a director of the new organization.

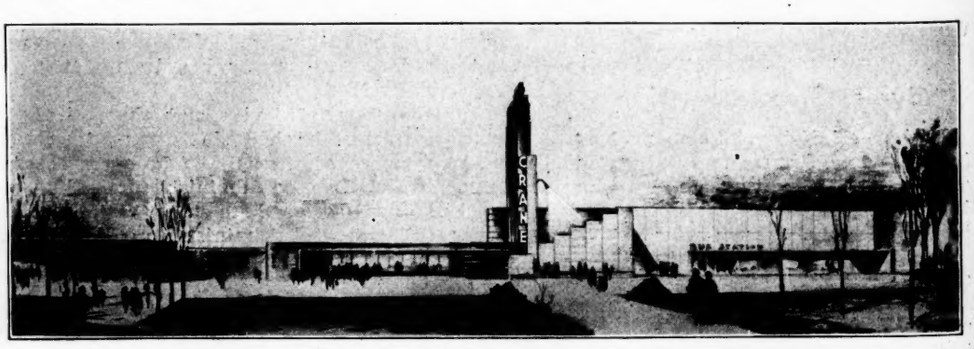
A.C. Company Formed

SPRINGFIELD, MASS.—Eugene P. Wagner and Anna M. Wagner of Hartford, Conn., and Albert E. Bailey, Norwell, Mass., have incorporated as Bailey-Wagner, Inc., under Massachusetts laws, to conduct an air conditioning equipment business. Capital consists of 500 shares, no-par stock.

Association Registers Heating Contractors

NEW YORK—The Construction Code Authority has designated the Heating, Piping and Air Conditioning Contractors National Association as the agency for the registration of heating contractors for the purpose of providing those contractors with official copies of the labor provisions of the Code for the Construction Industry.

The Heating, Piping and Air Conditioning Contractors National Association has mailed application forms with complete instructions as furnished by NRA to the last known address of all heating, piping and air conditioning contractors. Any heating, piping and air conditioning contractor who for any reason has not received a copy of the application form should communicate promptly with the Heating, Piping and Air Conditioning Contractors National Association, 1250 Sixth Avenue, New York.



The Crane Building at the Century of Progress Exposition, Chicago

Professional Engineers to Fight Any NRA Code; A.A.E. May Merge with New National Society

NEW YORK—After adopting resolutions opposing any NRA code for professional engineers, the New York State Society of Professional Engineers, in session May 26 at the Hotel Commodore, launched plans for the organization of a national professional engineers' society to combat certain phases of NRA.

Formal approval of the proposal for a national organization was voted after Dr. David B. Steinman, civil engineer and chairman of the board of trustees, had announced that the American Association of Engineers was willing to drop its name and with all its chapters enter into a merger with the new organization.

The following were named chairmen of committees to organize the national body: Arthur V. Sheridan, past president of the State society, executive committee; Prof. John C. Riedel, constitution; Charles Kelly, publicity, and J. Keith Legare, president of the South Carolina Professional Engineers Society, membership.

Mr. Sheridan said that it was the hope for those behind the movement to have the new organization established and functioning with headquarters in Washington when Congress meets next January.

Plans for the new organization were announced by Doctor Steinman following a conference on Friday of the New York State Society of Professional Engineers at which the proposal was discussed with representatives of engineering organizations from several other states.

Dr. Steinman explained that the new organization would aim to safeguard the welfare of the professional engineer from a legislative standpoint. The national body will strive through state groups to promote the enactment of engineer licensing in states that have no such provisions.

Doctor Steinman's announcement followed a statement by Arnold G. Chapman, president of the New York State Society of Professional Engineers, that "the necessity and advisability of a code for engineers is very objectionable." Mr. Chapman pointed out that the engineering code never had been adopted, though some 10 or 12 drafts had been prepared.

Mr. Chapman declared that at the code hearings last October he had opposed the code on the ground that the draft under consideration was not representative of the profession as a whole. Furthermore, the code failed to establish a schedule of minimum fees for the employer engineer, also minimum compensation for the employed engineer.

Mr. Sheridan suggested that the national organization should exert itself to bring about the formulation of an engineering code. He explained that while objections had been registered against parts of the proposed code for the engineering division of the construction industry, the engineers had been unable to present their demands effectively, due to the lack of a national organization.

The society reelected Mr. Chapman as president and elected Frederic R. Harris first vice-president, Professor Riedel second vice-president, Ernest F. Fox financial secretary, and Patrick M. Corry treasurer.

CHICAGO — The first organization meeting of the Consulting Engineers' Division of the Western Society of Engineers, as authorized under the rules for functional divisions approved by the Board of Direction March 27, was held May 10, for the dual purpose of perfecting the organization of the Division and for consideration of the revised draft of the Code for the Professional Engineers Division of the Construction Industry.

The revised draft was presented in full and thoroughly discussed. The suggestions offered were transmitted to the joint committee conferring with the NRA under the leadership of American Society of Civil Engineers for their guidance in further negotiations. The present draft is somewhat simpler than that previously offered, in that it reduces the number of classifications under which engineers may operate from six to two, namely, the professional and the engineer-construction methods.

The nominating committee appointed by the Consulting Engineers Division has nominated the following council: for a three-year term, S. R. Lewis and F. A. Randall; for two years, C. B. Burdick and F. F. Fowle; for one year, L S. Keith and C. L. Post. The temporary chairman, Edgar S. Nethercut, has arranged for a meeting of these nominees for the purpose of planning a preliminary program of activities for the Division.

AOBA Has 2367 Members

NEW YORK—The American Oil Burner Association has 43 manufacturer members, 64 individual members, and 2260 dealer members as of March 1, according to an announcement made by Morgan J. Hammers May 19. In addition, three manufacturer members are awaiting approval on their application for membership.

Anthracite Research Continues at Mellon Institute

PITTSBURGH—Mellon Institute of Industrial Research has announced that the multiple industrial fellowship on anthracite, established in that institution by the Philadelphia and Reading Coal and Iron Company in 1932, has been continuing, under Dr. H. J. Rose, senior fellow, its broad program of research on problems relating to the anthracite industry. So far this work has included studies of the chemical and physical properties of anthracite, new industrial uses, and economic investigations.

The staff of this Fellowship has also cooperated actively with the research and engineering specialists of the donor company in planning and conducting systematic investigations pertaining to domestic and industrial uses of anthracite.

Receivers for Follansbee

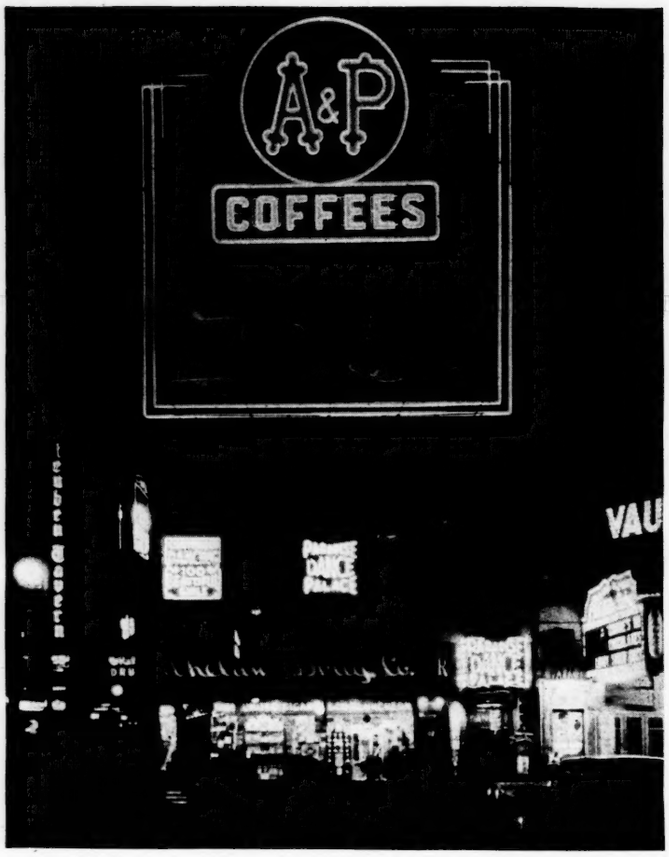
PITTSBURGH—Judge R. M. Gibson in U. S. District Court here has appointed John Follansbee, president, and George T. Ladd receivers for Follansbee Brothers, makers of sheet steel and warm-air furnaces. The petition, filed by William J. Kirk, of California, and the Aetna Standard Engineering Company, of Ohio, alleges that although assets exceed liabilities the company is unable to meet current obligations.

Heating and Plumbing Distinct, Court Rules

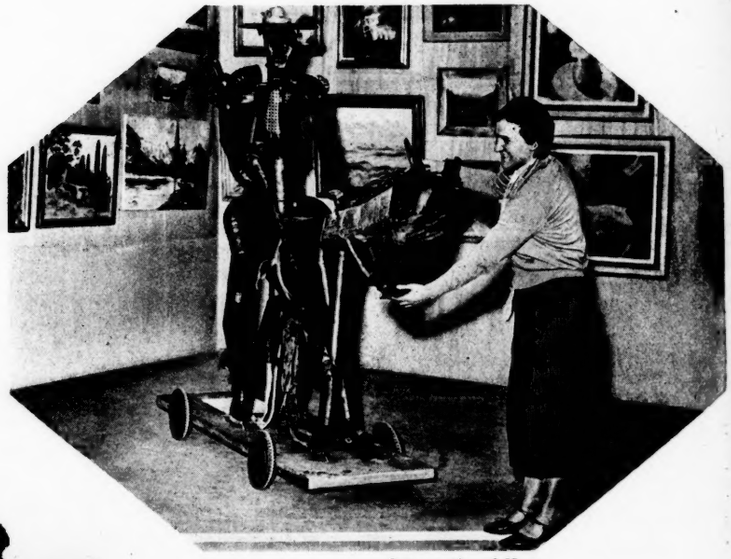
LYNBROOK, L. I.—A decision by Judge Cortland Johnson in the County Court of Nassau indicates that, at least so far as legal terminology is involved, the word "plumbing" is concerned only with the pipes and fixtures for the conveyance of gas, water, and sewage and is quite distinct from the heating and ventilating of buildings.

The decision arose over a judgment of conviction by the police justice of the incorporated Village of Lynbrook convicting the defendant, an oil burner dealer, of violating a village ordinance requiring a license for plumbing work. The defendant appealed, claiming that work done in connection with an oil burner hot water system and a heating plant was not "plumbing," and that therefore his acts were not in violation of the law. The Justice ruled that the distinction between plumbing and drainage on the one hand, and steam and hot water heating on the other, is to be found in the provisions of statutes governing the letting of contracts by municipalities and in other laws.

PICTURE PARAGRAPHS

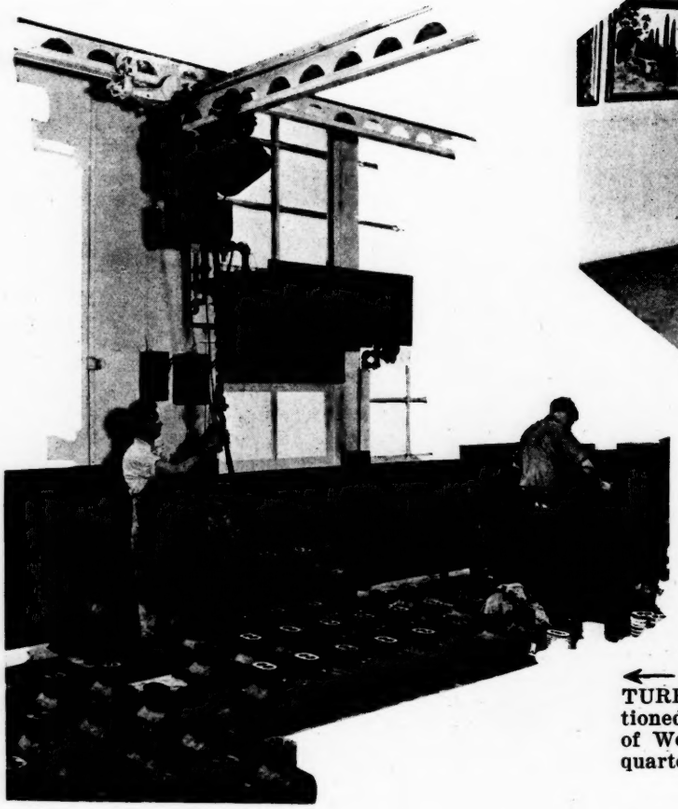


← NEW USE FOR STEAM. This sign at 47th Street and Broadway, New York, each month uses 35,000 lb. of steam, supplied by the New York Steam Corporation. Two of these signs are in operation, the other being in Brooklyn. Each is 15 ft. × 50 ft. They were designed by Douglas Leigh, one of the country's leading outdoor advertising experts, for Paris & Peart, advertising agency for A. & P.



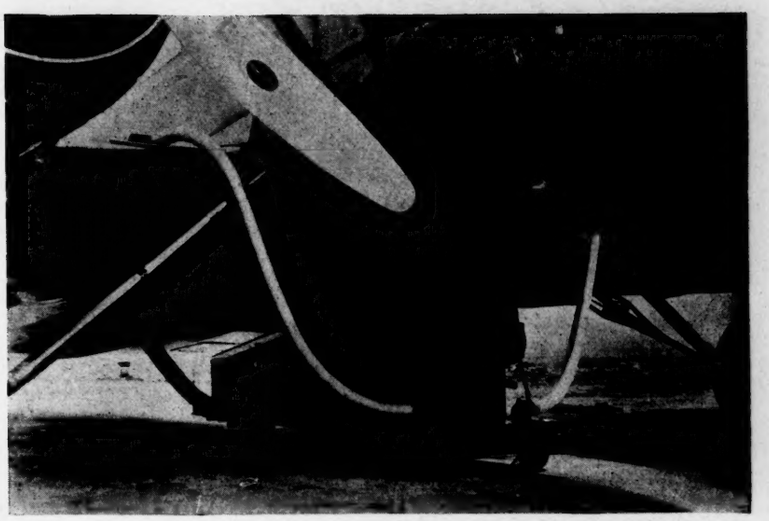
International News

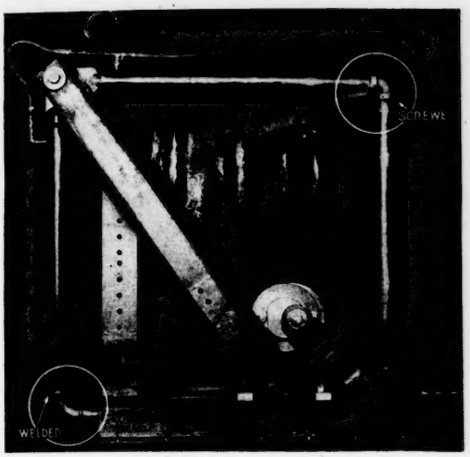
↑ EL PICADOR. Constructed of smoke pipe and vent pipe by Jose de Creeft for the Independent Artists Exhibition in New York last month.



← AIR CONDITIONING AIDS PRECISION MANUFACTURE. One of the four air conditioners that provides conditioned air for the sealed room in which the cooling mechanism of Westinghouse air conditioners are manufactured. Nearly a quarter of a million dollars has been spent in equipping the new manufacturing aisle at this plant.

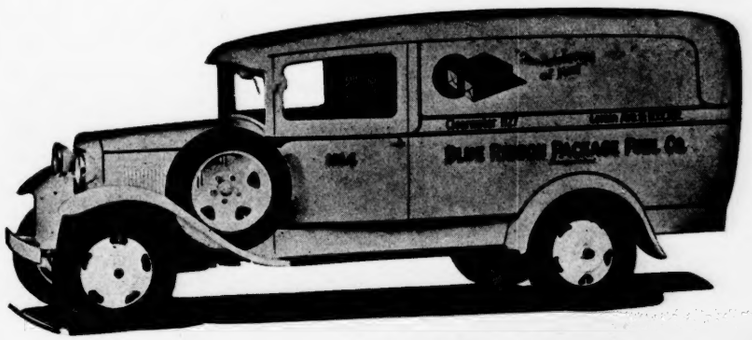
SLEEPPLANES of the Curtiss-Wright Airplane Company are pre-heated and pre-cooled while on the ground at the airports by a combination cooling unit, electric heater, and ventilator, thermostatically controlled and supplying 300 c.f.m. This unit makes it possible for passengers to go to sleep in comfort while the plane is on the ground before leaving.





↑ TORTURE RACK designed by Taylor Forge & Pipe Works for testing screwed and welded joints. The device duplicates the effect of expansion and contraction in the pipe lines where certain parts of the line are fixed so that the stresses are concentrated on the elbows.

↑ COOLING APPLE TREES. The U. S. Department of Agriculture is studying in Oregon the effect of freezing limbs of trees to very low temperatures. The freezing box shown holds solid carbon dioxide. Findings: Low temperatures in November or March caused more killing than in January.



Courtesy Coal Heat

WHAT, NO COAL BIN? Coal bin is obsolete and unnecessary when packaged fuel is used. Each package contains six cubes, total weight 15 lb. The packaged fuel is made from screenings of bituminous coal or coke and a binder, and forced into shape by Eberling coal cubing machines. Cleanliness of the fuel makes possible the use of clean and attractive trucks for fuel delivery. Packaged fuel has made considerable headway in Cleveland and Detroit.

Price of Ice for A. C. Up from 1933

CHICAGO—Prices for ice to domestic trade changed little in 1934 as compared with 1933, but prices to commercial trade increased in most parts of the country, according to the annual report of ice prices by *Ice and Refrigeration* of Chicago.

The following table, from the report, summarizes the average prices for different districts. Commercial trade is that using 100 lb. per day or over. Prices are in cents per 100 lb.

	Domestic	Light Commercial
Eastern States	55.2	42.5
Southern States	51.2	42.7
Mid-west States	52.9	40.7
Western States	65.2	43 3
Average	56 1	42 3

Dunham and Webster to be Cross-Licensed

CHICAGO—In a joint statement made April 27, the C. A. Dunham Company and Warren Webster & Company announced that they had entered into a cross-licensing agreement covering patents relating to heating systems.

The announcement stated that the major problem on which both companies have centered their attention in recent years has been that of providing a system so controlled that the correct amount of steam may be circulated under varying weather conditions to offset the variable heat loss from a building, and that through research along these lines a number of patents and applications have resulted covering equipment to accomplish this.

Each company will continue to specialize on its respective system—the Dunham differential system and the Webster moderator system.

The statement was signed by C. A. Dunham and Warren Webster, presidents of the companies.

Budgets Set for Code Authorities

WASHINGTON—Proposed budgets for Code Authorities for the calendar year 1934 are being rapidly filed with NRA. One recently filed for the Valve and Fittings Manufacturing Industry calls for a total of $94,080 and it is proposed to assess members of the industry ¼ of 1% of their sales, based on average of sales during 1932 and the first six months of 1933. The Administrator announced that objections to this proposal could be received by his office up to May 29.

The Pipe Nipple Manufacturing Industry filed an estimated budget of $20,000 to be assessed on the basis of 1% of the total volume of sales. May 31 was the last date for filing with NRA objections to this proposal.

Growing Scarcity of Fuel Oil Affecting Eastern Markets; Retail Prices Increase Gradually

NEW YORK—As a result of curtailment of imports from Columbia and Venezuela in an effort to help domestic producers, and due to the marked growth of the oil burner industry, there is an increasing scarcity of fuel oil in this market. The wholesale price has advanced within the last year from 60c to $1.35 a barrel, with a strong possibility of reaching $1.50.

Retail markets have not as yet been affected severely, the average price of the different grades of fuel oil having increased less than 10% in the last year. This is due to the fact that retailers are protected by contracts, but it is expected that as these contracts expire the price of fuel oil along the eastern seaboard will advance sharply. This will have an important effect upon the competitive situation among oil, gas, and coal as fuel for domestic and commercial heating systems.

Notwithstanding the fact that domestic consumption east of the Rockies declined 47 million barrels between 1929 and 1933, there has been a pronounced shortage of fuel oil for three of the last four years. This shortage amounted to 10 million barrels in 1932 and to 7 million barrels last year. During this period stocks have been reduced from 20 million barrels to 17 million barrels.

To some extent the shortage on the Atlantic seaboard has been relieved by shipments from California, where there has been a plentiful supply. For the first three months of the current year gas and fuel oil has been moving eastward through the Panama Canal at a rate of about 20 million barrels per year. However, this source is much more costly than the previous supply. The California market is above 65c a barrel and the charter rate for transportation to New York harbor adds as much more, bringing the cost on the eastern seaboard to a minimum of $1.30 per barrel before taking into account the costs of handling through terminals, and marketing.

There is nothing in sight at the moment to indicate that fuel oil will be more plentiful in the near future. With improvements in refining to recover the maximum percentage of gasoline, there has been a progressive decline in the yield of fuel oil, from 38% of the crude in 1929 to 32½% in 1933. This is a result largely of increased cracking of fuel oil. As compared with the earlier year, it is estimated that there has been an increase of 31,500,000 barrels of fuel oil used for the production of gasoline.

Another factor which has contributed to the scarcity is the increased demand for fuel oil for domestic and commercial heating. Four years ago the consumption of heating oil in the entire United States was 14 million barrels. Last year it was up to 74 million barrels.

For the first two months of 1934 there was a gain of 11% in the consumption of fuel oil over the first two months of 1933.

Frigidaire Opens Own St. Louis Branch; Lehman in Charge

ST. LOUIS — Establishment in St. Louis of a company-owned branch of Frigidaire Corporation is announced by E. G. Biechler, president.

Herman F. Lehman, new manager of St. Louis branch of Frigidaire

The Frigidaire business previously was conducted by the Del Home Light Company in southern Illinois and eastern Missouri, and this present change is made necessary by the death two months ago of W. O. Waldsmith, founder and president of the Del Home Light Company.

Frigidaire is establishing its headquarters in the building occupied by Del Home Light Co., 3414-28 Lindell Boulevard. Herman F. Lehman has been appointed manager of the branch. He was formerly assistant manager of the commercial division of Frigidaire, with headquarters in Dayton, and formerly was national installation and service manager.

The St. Louis branch has jurisdiction over air conditioning and refrigeration operations in eastern Missouri and southern Illinois.

Huffaker to Omaha

LANSING, MICH.—Dail Steel Products Company has transferred H. B. Huffaker to the Omaha territory with offices at 1111 Harney St., Omaha.

A.S.H.V.E. to Hold Summer Meeting in Pocono Mts.; Joint Session with A.S.R.E. Planned

NEW YORK—The 1934 semi-annual meeting of the A.S.H.V.E. will be held at The Inn at Buck Hill Falls in the Pocono Mountains in Eastern Pennsylvania, June 20-22. The Philadelphia chapter will be host to the Society at the meeting, and the Committee of Arrangements from that Chapter, consisting of R. C. Bolsinger, W. P. Culbert, W. R. Eichberg, J. H. Hucker, W. F. Smith, and M. F. Blankin, has planned an extensive entertainment program.

A feature of the meeting will be a joint technical session with the A.S.R.E., which will hold its spring meeting nearby at Skytop. W. H. Carrier, past president of both societies, will preside at the joint session. Joint entertainment features are also planned.

Among the business to be transacted at the summer meeting is a proposal to amend the By-Laws to read that the admission fee shall be determined by the Council until 1940 instead of until 1935 as now called for. An extension until 1940 is also asked on the rule to the effect that the annual dues of members shall be determined by the Council until 1935.

The program follows:

JUNE 19—MORNING

Guide Publication Committee Meeting.

JUNE 19—AFTERNOON

Meeting of the Committee on Research.

JUNE 19—EVENING

Dinner and Meeting of the Council.

JUNE 20—MORNING

Criteria for Industrial Exhaust Systems—J. J. Bloomfield.

Dry-Bulb vs. Effective Temperature Control—A. E. Beals.

Influence of Stack Effect on the Heat Loss from Tall Buildings—Prof. Axel Marin.

Wind Velocities for a Building and Their Effect on Heat Loss—F. C. Houghten, J. L. Blackshaw, and Carl Gutberlet.

JUNE 20—AFTERNOON

Examining the Construction Recovery Program—Malcolm Muir.

JUNE 20—EVENING

Beefsteak Dinner at Skytop with A.S.R.E. Members.

JUNE 21—MORNING

Breakfast Meeting of Nominating Committee.

Joint Session of A.S.R.E. and A.S.H.-V.E.—W. H. Carrier presiding.

A.S.R.E. Technical Papers:

The Water Vapor Centrifugal Compressor—Paul Bancel, manager, Condenser Dept., Ingersoll-Rand Company.

Electric Rate Making for Small Air Conditioning Units—D. W. McLenegan, assistant engineer, Air Conditioning Dept., General Electric Company.

The Reemployment of the Construction Industry—Thomas S. Holden, vice-president, F. W. Dodge Company.

A.S.H.V.E. Technical Papers:

Operating Results of an Air Conditioning System Compared with Design Figures—J. R. Hertzler.

What is the Cooling Load Factor in Air Conditioning?—John Everetts, Jr.

JUNE 21—EVENING

Banquet, Entertainment and Dance.

JUNE 22—MORNING

Amendments to Constitution and By-Laws.

Insulating Value of Bright Metallic Surfaces—Prof. F. B. Rowley.

Heat Transfer from Direct and Extended Surfaces with Forced Air Circulation—Prof. G. L. Tuve and C. A. McKeenan.

Factors Affecting the Heat Output of Convectors—Prof. A. P. Kratz, M. K. Fahnestock, and E. L. Broderick.

The 21st spring meeting of the A.S.R.E will be held at The Lodge, at Skytop Club. Skytop, Pa., six miles from Buck Hill Falls, June 20-22.

The A S.R.E. program includes:

JUNE 20—MORNING

Sound Measurement Applied to Refrigeration Equipment (Lecture and demonstration)—E. J. Abbott, research physicist, University of Michigan.

The Marketing of Commercial Air Conditioning—Everett Ryan, chairman, Boston Section, A.S.R.E.

JUNE 20—AFTERNOON

Address on Refrigeration in the T.V.A.

JUNE 20—EVENING

Dinner at Skytop with A.S.H.V.E.

JUNE 21—MORNING

Joint session of A S.R E. and A.S.H.-V.E.—See A.S.H.V.E. program.

JUNE 22—MORNING

Commercial Storage of Meats—R. E. King, General Electric Company.

The Rural Milk Problem—John E. Nicholas, Department of Agricultural Engineering, Pennsylvania State College.

Kelvinator Promotes Terry

DETROIT—M. C. Terry, former manager of the company's air conditioning department, has been appointed head of the commercial applications department of the Kelvinator Sales Corporation. Mr. Terry succeeds John Wyllie, who resigned to join the Liquid Cooler Corporation as general sales manager. The department under Mr. Terry's supervision replaces Kelvinator sales engineering department and includes air conditioning work.

Mr. Terry joined the company in September, 1932, and prior to that was connected with the Westinghouse Electric & Manufacturing Company.

Howell Heads Revere West Coast Sales

NEW YORK—A. J. Howell has been appointed manager of the Pacific Coast district of Revere Copper and Brass Incorporated to succeed R. H. Binns, Jr., who has moved to the executive offices in New York as assistant general sales manager.

L-K Laboratories Conditions Super Market

BOSTON—Lord-Kendall Laboratories has installed air conditioning equipment in the Second National Bank here; the Junior High School at Newburyport, Mass.; the Weber Duck Inn at Wrentham, Mass., and the J. Drexel Biddle mansion in Philadelphia. Another new and novel installation is that in the Brockelman Bros. Super Market in Lawrence, where the unit has been placed in the middle of the street floor where all of the customers may see it.

The Laboratories have arranged for a course of 10 lectures, one each week, on air conditioning for dealers and their salesmen.

Crane Credit Man Chairman of Group

LOS ANGELES—C. W. Dittmar, of Crane Company's Los Angeles branch, will be chairman of the plumbing and heating group at the forthcoming Credit Congress of Industry to be held in Los Angeles, June 11-15. The Congress is the trade group meeting day of the annual convention of credit men.

Battle New Secretary

WASHINGTON—J. D. Battle was appointed executive secretary of the National Coal Association effective May 1. He has been connected with the Association for the past 14 years.

Mr. Battle succeeds C. B. Huntress who resigned to become president of Appalachian Coals, Inc.

St. Louis Pushes Modernizing

ST. LOUIS—Plans for a building renovation campaign to be held here next autumn are being made by the Civic Development Committee of the Chamber of Commerce. Luther Ely Smith is chairman.

Heat Transfer Experts from Universities and Industry to Hold Meeting at Cornell

STATE COLLEGE, PA.—The outstanding meeting of the year on heat transfer has been arranged by a committee of the Society for the Promotion of Engineering Education, which will hold a Symposium on the "Content and Teaching Methods of Heat Transfer Courses" at Cornell University, June 19-21.

On the morning of June 19 there will be a discussion of the "Place and Scope of Heat Transfer Courses for Undergraduate and Graduate Students in the Different Engineering Schools." "The Place of Heat Transfer in Mechanical Engineering Courses" will be discussed by Prof. F. O. Ellenwood, of Cornell, which will be followed by a discussion. Prof. W. H. McAdams, Massachusetts Institute of Technology, will present a paper on "Methods of Teaching Heat Transfer, Theory and Laboratory," followed by a discussion and three-minute papers on how other instructors have arranged their courses.

"Thermal Radiation—Subject Matter and Laboratory Technic" will be the subject of a paper presented Tuesday afternoon by H. C. Hottel, Massachusetts Institute of Technology, while R. H. Heilman, Mellon Institute, will present a paper on "Thermal Radiation—Methods of Investigation and Industrial Applications." Prof. F. B. Rowley, University of Minnesota, will talk on "Conduction—Subject Matter and Laboratory Technic." Professor McAdams and Mr. Drew, both of Massachusetts Institute of Technology, will speak on "Convection—Natural and Forced." These will be followed by discussions.

In the evening, "The Hydrocal: A New Hydrodynamic Instrument for Solving Heat Transfer and Temperature Rise Problems" will be discussed by Prof. A. D. Moore, University of Michigan.

Prof. W. L. Badger will present a paper Wednesday afternoon on "Heat Transfer and the Phenomena of Evaporation." This will be followed by a paper on "Heat Transfer and the Phenomena of Condensation of Pure Condensable Vapors."

At the same meeting, "Heat Transfer and the Phenomena of Condensation of a Mixture of Condensable and Non-Condensable Gases" will be discussed by A. P. Colburn, E. I. DuPont de Nemours. E. C. Rack, Johns-Manville Company, will speak on "The Organization of a Course in Heat Transfer," which will be followed by a paper on "What Knowledge of Heat Transfer does Industry Expect of College Graduates in Mechanical and Electrical Engineering?" by W. J. King and W. L. Knaus, General Electric Company.

"Dimensional Analysis" will be the subject of a paper by J. F. D Smith, Harvard University, on the afternoon of June 20, while Mr. Drew will present a paper on "Effect of Heat Transfer on Flow of Fluids." A paper on "Economics of Fluid Mechanics and Heat Transfer" will also be presented.

The committee in charge of the program consists of—chairman, Prof. F C. Stewart, Pennsylvania State College; secretary, E. R. Queer, Penn. State; W. J. King; H C. Hottel; and A. M. White, University of North Carolina.

Conditioned Homes for Dallas

DALLAS—Twenty-seven air conditioned residences will be built by the Housing Corporation of Dallas during the next few months. They will be located north of Southern Methodist University. The company has option on lots for 30 more similar buildings. Gas-fired conditioning plants will be provided, with cooling optional at extra cost.

Boston Chapter Elects Officers

BOSTON—Installation of the 1934-35 officers was held at the Hotel Brunswick during the May 14 meeting of the local A.S.H.V E Chapter. W. T. Jones was the installing officer. The new president took the chair and presided over a symposium of heating propositions presented by five prominent representatives of equipment manufacturers. Their problem was to sell to R. S. Franklin, posing as the prospective builder of a new home, their type of equipment.

New officers of the chapter are: Ralph S. Franklin, president; Joseph Brinton, vice-president; E. W. Berchtold, treasurer, and William McPherson, secretary.

The following Board of Governors was appointed: E. W. Berchtold, Joseph Brinton, A. B. Jackson, C. T. Flint, R. S. Franklin, L. A. Bissonette, G. B. Gerrish, William McPherson, and Edgar Shaw.

Boston Utility and Contractors Cooperate in Campaign on Gas-fired Radiators

BOSTON—A highly successful campaign for placing gasteam radiators with customers on the rental-purchase plan was recently brought to a close by the Boston Consolidated Gas Company with a notable record of sales of radiators and gas as well. It was started September 1, 1933 and continued through the heating period up to this spring. About 400 radiators were placed under this rental-purchase plan, by which the customer could have the rentals he had paid applied to outright purchase of the radiator at any time up to the end of the second heating season, payments being spread over a four-year period. After the end of the second heating season only half the rentals paid were allowed on the purchase price, rental fees varying from $1.25 to $2.60 according to type and size of radiator in use.

The sales campaign was started after a meeting of company salesmen, supervisors, and shopmen, who turned in prospect lists to the sales promotion manager, J. J. Quinn. A two-color circular with prepaid return card was sent to each prospect in the name of the employee who had turned in the name, that employee's name being signed to the circular.

Contractors and dealers cooperating with the company also had the privilege of renting these radiators to their own customers, and were allowed a commission. In cases where their placement called for "delivery only," and they handled the financing, they were allowed a commission of 25%. Where the sale was made by a gas company salesman to a prospect on whom a contractor turned in a card the commission was 10%.

Inasmuch as the rental charge was only for eight months, the so-called "heating period," and there was no rental charge during the other four months, the cost being only for gas consumed, all but a very sma'l percentage of the customers retained the radiators.

There was a small installation charge, covering the pipe footage required for connections, where the pipe required did not exceed an average of 15 ft. per radiator. Pipe in excess of that was charged at the rate of 40 cents per foot. Installation charges and one month's rent were required with the order. After that the rental was added to the regular monthly gas bill.

Increased gas consumption by reason of the sales of these 400 radiators is estimated at some 16 million cu. ft. Most of the installations have been with commercial customers who needed extra heat after hours or were located in places where there was no central heating plant, and the type mainly sold was that without room temperature automatic control, with a consumption of about 1200 cu. ft. of gas per square foot of radiation per season.

It is confidently predicted that sales for the 1934 heating season will be double those of 1933, or around 800 radiators. Those for last season were double those of 1932, when the radiators were only sold outright. Outright sales will be continued for those customers who prefer that method.

Proposal Made to Amend Furnace Code to Include Accessories and Parts; Budget for Code Authority Set Up

WASHINGTON—Amendments to the Code of the Warm-Air Furnace Manufacturing Industry filed here propose that the scope of the industry be extended to take in the manufacture of furnace parts and accessories as well as furnaces. A code covering the manufacture of warm-air furnaces has been in effect for some time and the proposal to extend it to take in parts and accessories is a move toward consolidating activities under one authority.

A budget proposal submitted by the Code Authority for the period of December 1, 1933, to December 31, 1934, calls for the expenditure of $27,507.83 for the Code as approved and for a total of $34,192.83 in case the existing Code was amended to include the manufacture of parts and accessories.

The proposed budget follows:

Salaries	$11,901
Traveling Expense	9,324
Rent	683
Postage	1,500
Telegraph and Telephone	750
Printing	950
Supplies	700
Office Equipment	600
Legal and Professional	350
Miscellaneous Expense	750
	$27,508

The one proposed in case amendments to the Code are approved, is made up of the following items:

Salaries	$14,386
Traveling Expense	11,324
Rent	883
Postage	2,200
Telegraph and Telephone	900
Printing	1,350
Supplies	900
Office Equipment	900
Legal and Professional	500
Miscellaneous Expense	850
	$34,193

A. W. Wrieden, Code Authority Manager, states that under the terms of the approved Code which calls for assessments of costs on the basis of volume of business, on December 1, 1933, members were asked to pay an assessment of 1/20 of 1% of their furnace sales for the 11 months period of from January 1, 1933, to November 30, 1933. On February 20 the Code Authority called for the payment of the second installment of 1/10 of 1% of the furnace sales during the year 1933. The total amount received from these two assessments up to April 16, 1934, was $7,856.76. These assessments were paid by 76 companies out of an estimated 117 companies in the industry.

O. B. Company Formed

BOSTON—The Austus Oil Burner Co., Medford, with $50,000 capital, has been formed to manufacture oil burners. The incorporators are Wendell F. Austin and Edmund S. Marble, Medford, and Warren E Titus, Winthrop.

Schulze New Eastern S. M. for Kewanee

KEWANEE, ILL.—Kewanee Boiler Corporation has announced the appointment of Ben H. Schulze as eastern sales manager with supervision over the 21 branches in that territory, effective May 7.

Mr. Schulze has been district manager for the last two years. He started with the company in its St. Louis branch some 15 years ago.

His headquarters will be in the New York offices, 35-37 West 39th Street.

Senft Promoted

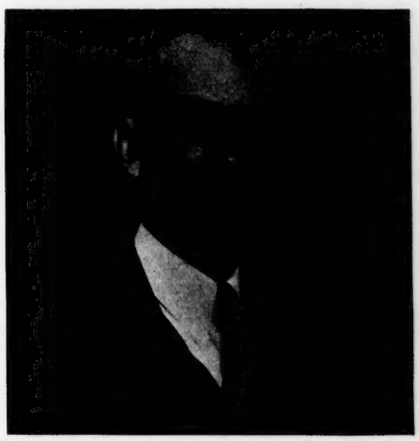
CINCINNATI—The Edwards Manufacturing Co., Cincinnati, has promoted W. G. Senft, engineer, to manager of the heating and air conditioning division. Mr. Senft has been associated with the design, production, and sale of Hot-Kold winter air conditioning units since 1929.

Walsh New S. M. for Campbell

NEW YORK—Special simplified air conditioning equipment to be used in conjunction with radiator heating systems and sold by the contractors who are now supplying those systems is now being prepared for sale by the affiliate companies of the American Radiator & Standard Sanitary Corporation, according to Fowler Manning, director of the air conditioning division of the corporation.

Mr. Manning made this statement in announcing the appointment of E. V. Walsh, formerly vice-president in charge of sales and advertising for the Timken Silent Automatic Company, as sales manager of the air conditioning division of the Campbell Metal Window Corporation.

Mr. Walsh was connected with Timken for eight years, following eight years with the International Time Recorder Company.



Fowler Manning, director of air conditioning division, American Radiator and Standard Sanitary Corp.

Annin Joins Minneapolis-Honeywell

MINNEAPOLIS—Douglas Annin, who has been actively identified with the distribution of industrial process controls for the last 10 years, has joined the staff of Minneapolis-Honeywell Regulator Company in a sales and engineering capacity.

Prior to joining Minneapolis-Honeywell, Mr. Annin was chief engineer of Neilan Company, Ltd., Los Angeles, and when this firm was merged with the Mason Regulator Company, Mr. Annin became sales engineer of the Mason-Neilan Regulator Company of Boston. He is a graduate of the California Institute of Technology.

Harry Hart Elected to Code Board

WASHINGTON—At a meeting of the Construction Code Authority May 4, members of the Construction Appeals Board were elected, as provided for in the NRA Code for the Construction Industry.

The Code provides that this Board shall be composed of one architect, one professional engineer, three general contractors and four special contractors. The members appointed are: Engineer, Wilson T. Ballard, vice-president, J. E. Greiner Co., Baltimore; general contractors, John W. Cowper, president, John W. Cowper Co., Buffalo; R. B. Howland, United Engineers & Constructors, Inc., Philadelphia; W. R. Smith, Lane Construction Co., Meriden, Conn.; special contractors, Harry M. Hart, president, L. H. Prentice Co., heating, piping and air conditioning contractors, Chicago; J. M. Krafft, Krafft Murphy Co., contracting plasterers, Washington, D. C.; E. A. Rule, masonry contractor, Washington, D. C.; J. J. Shanahan, plumbing contractor, Norfolk, Va.; architect, Franklin O. Adams, Tampa, Fla.

This Board, provided for in Article 5 of Chapter One, Section One, of the Construction Code, is set up to hear and determine appeals referred to it by divisional code authorities and also to determine which chapter shall apply in the case of conflict of interpretations as to which chapters of the Construction Code apply in a specific instance.

Glen Heads Boiler and Radiator Sales

CHICAGO—W. K. Glen, Chicago district manager of Crane Company, has been made manager of the boiler and radiator sales department of Crane Company, with headquarters at 836 South Michigan Avenue.

Reading Iron Transfers King

BOSTON—Effective April 3, A. F. King, formerly with the Buffalo and Philadelphia district sales offices of the Reading Iron Company, was transferred to Boston as district sales representative.

John G. Ross, for many years district sales representative in Boston, has resigned to accept a position elsewhere.

Jersey to Have A.C. Show

NEWARK—An air conditioning show, to be sponsored by Public Service Electric and Gas Company, will be held June 4-9 in the former American Insurance Company Building, adjacent to the Public Service Terminal Building in this city.

The show will consist of three main features: a display of summer air conditioning equipment by manufacturers, a display of winter air conditioning equipment, and an educational exhibit featuring air conditioning.

The Public Service Electric and Gas Company is sponsor and H. P. Morehouse, the utility's general air conditioning representative, will be director of the show. James H. Stapleton heads the arrangements committee; Thomas H. Spain, advertising assistant, is chairman of the publicity committee, and Clayton S. Cronkright is chairman of the educational committee.

Connecticut Dealers Appointed

HARTFORD, CONN.—The Connecticut Oil Heating Company has been appointed distributor of air conditioning and commercial refrigeration equipment manufactured by the York Ice Machinery Company for Connecticut, excepting Fairfield and New London counties. The company recently received a contract to install an air conditioning system in a new building being erected in West Hartford.

Barlow Bros. Company, Waterbury dealer in heating equipment, has been reorganized as a new corporation with authorized capital of $50,000, of which $5,500 has been paid in. Officers include Oliver R. Barlow, president; Norman C. Armstrong, secretary, and Wilbur C. Winship, treasurer.

Victor F. Millward, president of The Byrnes-Millward Company, Hartford heating contractor, has announced retirement from the firm of T. F. Byrnes. The business will be continued without other changes.

The Lyman Corporation has been organized in New London with showrooms on State Street to deal in commercial and domestic heating systems, featuring Westinghouse appliances and equipment. Paid-in capital of the corporation is $5,000, and the incorporators are John M. Lyman and Charles and Joseph Suisman.

COMING EVENTS

JUNE 12-14, 1934. *Mid-Year Meeting of the National Warm Air Heating and Air Conditioning Association, Chicago, Ill. Headquarters at the Stevens Hotel.*

JUNE 12-15, 1934. *Twenty-Fifth Annual Convention of the National District Heating Association, Rochester, N. Y. Headquarters at the Sagamore Hotel.*

JUNE 18-23, 1934. *Convention and Exhibit of the National Association of Building Owners and Managers, Toronto, Canada. Headquarters at the Royal York Hotel.*

JUNE 19-21, 1934. *Symposium on the Content and Teaching Methods of Heat Transfer Courses, Society for the Promotion of Engineering Education, at Cornell University, Ithaca, N. Y. Secretary of committee in charge, E. R. Queer, The Pennsylvania State College, School of Engineering, State College, Pa.*

JUNE 19-22 1934. *Annual Convention of the Smoke Prevention Association, Buffalo, N. Y. Headquarters at the Hotel Statler.*

JUNE 20-22, 1934. *Spring Meeting of the American Society of Heating and Ventilating Engineers, Buck Hill Falls, Pa. Headquarters at The Inn.*

JUNE 20-22, 1934. *Spring Meeting of the American Society of Refrigerating Engineers, Skytop, Pa. Headquarters at the Skytop Club.*

JUNE 25-28, 1934. *Semi-Annual Meeting of the American Society of Mechanical Engineers, Denver, Colo. Headquarters at the Cosmopolitan Hotel.*

AUGUST 27-SEPTEMBER 1, 1934. *Second Annual Convention and Show of the National Association of Power Engineers, Minneapolis, Minn.*

SEPTEMBER 19-29, 1934. *Second Annual National Electrical and Radio Exposition, Madison Square Garden, New York.*

OCTOBER 29-NOVEMBER 2, 1934. *Sixteenth Annual Convention and Exposition of the American Gas Association, Atlantic City Auditorium, Atlantic City, N. J.*

DECEMBER 3-8, 1934. *Eleventh National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.*

Pollard Elected by Northwest Group

SEATTLE—The annual meeting of the Pacific Northwest chapter, A.S.H.V.E., was held here in May. A. L. Pollard, Puget Sound Power & Light Company, large western Washington privately-owned utility, was elected president of the chapter. Lincoln C. Bouillon, consulting engineer of Seattle, was chosen as the new vice-president, while S. D. Peterson, northwest manager of Johnson Service Company, was re-elected secretary; W. W. Cox, Heating Service Company, Inc., Seattle, was elected treasurer. A party was staged for the incoming officers following their election to office.

A. C. Show Held by Chicago Utility

CHICAGO—An air conditioning exposition was held by the Commonwealth Edison Company at its Dearborn Street store, May 7-11. Twelve manufacturers were represented. Particular interest was expressed in cooling offices, stores, bedrooms, sick rooms, and restaurants, and exhibitors expressed themselves pleased at the number of leads they obtained for their salesmen. One manufacturer closed the sale on a three-ton cooling job for a dress shop, a sale which resulted from the exhibition.

Cost of installation was the principal point about which most questions were asked. There was no new equipment exhibited.

Manufacturers represented and who displayed cooling units included General Electric by Air Conditioning Corporation, Ilg Electric Ventilating Company, Westinghouse Air Conditioning Company, Carrier Engineering Corporation, Midwest Engineering & Equipment Company, Frigidaire, General Refrigeration Sales, and Servel Sales. Other exhibitors were Airgard Ventilator Corporation, and American Air Filter Company.

Boston Utility Has Good Season

BOSTON—Due to the severely cold winter just passed, the Edison Electric Illuminating Company of Boston supplied 825,000,000 lb. of steam to its customers this past heating season through its eight miles of piping under the principal streets.

The largest customer for district steam in Boston is the North Station Group, which includes the railroad station, Boston gardens, and the Hotel Manger, which used 115,000,000 lb. of steam per year. The Christian Science Publishing Company is the next largest customer and uses 75,000,000 lb.

American Furnace Modernizes

ST. LOUIS—The American Furnace Company is celebrating its 35th anniversary this year, and has recently made improvements in its plant and offices costing $10,000.

A show room has been installed in the east front portion of the main office and factory building located at 2729 Delmar Boulevard. The business offices have also undergone extensive alterations. Plant facilities have also been modernized and include installation of new manufacturing equipment.

Bethlehem Reorganizes Oil Burner Sales

BETHLEHEM—Bethlehem Foundry & Machine Company has reorganized its oil burner sales division along functional lines.

C. S Dieter, who has been connected with the company for many years and with the oil burner sales division during the past year, will be responsible for records, orders, shipment, and correspondence. William M. Goodwin will be in charge of all marketing functions.

Sears, Roebuck to Condition

CHICAGO—This city will have the first great windowless department store. Radical changes in the original design of the big $1½ million Sears, Roebuck and Company's Englewood store, now being erected at 63rd and Halsted Streets, will eliminate the conventional windows on the four selling floors, since the entire store will be artificially lighted and completely air conditioned.

Carroll New S. M. of Gamewell

NEWTON, MASS.—Appointment of William J. Carroll as general sales manager of The Gamewell Company and its subsidiaries has been announced by President Vincent C. Stanley.

During the 15 years that Mr. Carroll has been with The Gamewell Company, he has occupied the positions of publicity manager, sales engineer, and vice-president and general sales manager of the Rockwood division of The Gamewell Company. He leaves the last position at Worcester to take up his new duties in the main office of The Gamewell Company here. Prior to his association with Gamewell, Mr. Carroll spent several years with two nationally-known advertising agencies. He is a native of Boston and is widely known among municipal officials in New England.

Gamewell subsidiaries include The Holtzer-Cabot Electric Company, Boston; Rockwood Sprinkler Co., Worcester, Mass., and the Eagle Signal Corp., Moline, Ill.

Dust Storms Sweep Country

NEW YORK—Since 1928 the Weather Bureau has added to its nomenclature of atmospheric conditions that of "Dusty Weather." Storms had been crossing, as they now cross, the arid regions of the Rocky Mountains, causing little or no precipitation. When several years pass with growing deficiency in precipitation, as in the states from Montana to Wisconsin, drouth becoming existent, these dry storms become a menace to the people of the plains and states to the east.

After a freshet there is usually a drouth, recovery from the last of which in 1930 has never been complete in the northern plain states. Storms there of late years have been developing sand whirls. This year their number has been noticeably increased.

Whirls of this type in March and April were confined to their native and adjacent states, but in May one of them became attached to a transcontinental area of low barometer of cylonic propensities and carried eastward. On the 9th it spread dust over the states from Kansas and Missouri to Manitoba; on the 10th from Kentucky to including the Lake regions, and on the 11th the middle Atlantic states and New England.

The phenomenon of dust-laden winds, leaving a deposit of dust in every factory, store, office and home, including the chimney, attracted widespread attention. The dust became measurable in quantity in terms of millions of tons.

G.&B. Opens New Branch

DETROIT—Gilbert & Barker Manufacturing Co., Springfield, Mass., has established a factory branch for distributing oil burners in this territory. The branch is located in Convention Hall.

Ice Company in NRA Test Case

NEW ORLEANS—A bill of complaint has been filed in the Federal District Court for the Eastern District of Louisiana by U. S. District Attorney Rone A. Viosca and William H. Griffin, Assistant Counsel, Litigation Division, N.R.A., charging the Truckers Ice and Cold Storage Co. of Kenner, La., with selling ice outside of its normal market at a price lower than that existing in the invaded market, thereby disrupting the ice business in the new market and seriously injuring the ice dealers in that area. This is the first case of this kind ever brought under an N.R.A. code, and is regarded by the Litigation Division as a very important test case. Judge Wayne G. Borah, despite arguments by the defendant, has granted a temporary stay requiring the defendant to comply with the code provisions.

Code Case to Go to Court

NEW YORK—The Kam Water Heater Manufacturing Company of Brooklyn, must stand trial in New York's Court of Special Sessions for an alleged violation of the NRA code for the heat exchange industry, Magistrate Guy Van Amringe, sitting in Commercial Frauds Court, ruled May 16.

The complainant was Clifford C. Rohrbach, supervisory agent for the Heat Exchange Institute, who charged that on April 27 the corporation sold two heaters to a resident of the Bronx for $7.81. Mr. Rohrbach alleged that this was below the list price, and therefore a violation of the industry's code.

Pattison New Silent Glow Adv. Mgr.

CHICAGO—E. M. Pattison, vice-president of the Silent Glow Oil Burner Corporation, who has been in charge of distribution for his company in Chicago for the past three years, has been transferred to the home office at Hartford, Conn.

Fred Hallgren, who has been in the oil-burning industry in Chicago for a number of years, will take charge of the Chicago office.

Fisher Appoints Weeks

MARSHALLTOWN, IOWA—The Fisher Governor Company has announced the appointment, effective June 1, of the Weeks Engineering Company, St. Louis, as factory representative for the St. Louis territory. Harry T. Weeks is manager of the company.

Toridheet Makes Appointments

CLEVELAND—O. C. Parker, formerly wholesale representative for the Timken Silent Automatic Corporation, has joined the field organization of the Cleveland Steel Products Corporation, Toridheet Division.

Mr. Parker, who becomes a district sales manager, will contact present dealers and distributors and establish new outlets for Toridheet in the North Central states.

William R. Porter, formerly Timken branch manager, has been appointed manager of the oil burner division of Waite and Faunce, New Bedford, Mass., Toridheet dealers.

Toridheet also announced appointment of the following dealers: Reading and Reading, Trenton, N. J.; William E. Lewis, Reading, Pa.; H. T. Maring, Gettysburg, Pa.; Toridheet Sales and Service, Rochester, N. Y.; Penn Oil Burner Co., Boston; Royal Oil Co., St. Paul, Minn.; Home Appliance Co., Savanna, Ill., and Domestic Utilities Supply Co., Oshkosh, Wis.

Illinois Firm Starts

JOLIET, ILL.—The Joliet Heating Corporation is in production and will have its line on the market early in June.

Included in the company's line are steel boilers for stoker, gas, or oil firing; a warm-air heating and conditioning unit, and a super-heater boiler.

Haynes Speaks in Canada

TORONTO—C. V. Haynes, president of the A.S.H.V.E., spoke in detail on the work being done by the society at the annual meeting of the Ontario Chapter May 15. He stressed forcibly the decided benefits from research work.

John Howatt, vice-president of the A.S.H.V.E., and chairman of the Research Committee, outlined in an interesting manner the work being carried on by the Research Laboratory, which is at present investigating 15 projects.

W. R. Blackall, new chapter president, stated that the chapter had gained 14 new members since last autumn, and suggested that more members' nights be held in order that discussions might be carried on among the members. Attendance at the meetings throughout the season ranged from 27 to 40.

St. Louis Adds 77 A.C. Jobs

ST. LOUIS—Union Electric Light and Power Company, Lewis H Egan, president, reports a total number of 77 air conditioning units added to its lines during the past year. The company had 91 units on its lines prior to January 1, 1933. Twenty-one of the new installations were in offices and 34 in residences.

Texas Hotel Conditioned

LAREDO, TEX.—Wm. A. Ebert, agent for Auditorium Air Conditioning Systems, reports the installation of air conditioning in the Laredo Plaza Hotel coffee shop. M. L. Diver of San Antonio was the engineer, and the equipment was furnished by the York Ice Machinery Corporation.

Of particular interest in connection with this installation is the fact that this is the first air conditioning installation in Laredo, and it is the only hotel south of San Antonio to have air conditioning.

Haynes Appointed

NEW YORK—C. V. Haynes, president, and Homer Addams, a past president, of the A.S.H.V.E., are on the advisory committee in connection with the 11th National Power Exposition to be held at Grand Central Palace, December 3-8. Other members of the committee include Irving E. Moultrop, Paul Doty, David Moffatt Myers, and others.

A. C. for Washington University

ST. LOUIS—The Guaranteed Heating & Engineering Company reports the installation of an Auditorium air conditioning system in the Hall of Physics, Washington University. The air conditioning system will be utilized in the Research Department laboratory.

A. H. Vigel is the engineer on this installation. American Blower Corporation equipment is installed.

Air Conditioning Discussed at Tri-state Meeting in Denver

DENVER—Selling the idea of air conditioning to residents of a region that boasts of the exuberating effect of its weather at all seasons is the task of the air conditioning industry in the Rocky Mountain region, according to E. Dorsey Davis, manager of the Denver branch of the Frigidaire Sales Corporation. Mr. Davis spoke on "The Future of Air Conditioning in the Rocky Mountain Region" at the eighth annual tri-state conference sponsored by the Electrical League of Colorado and the Rocky Mountain Electrical Association, held here April 25-26. More than 200 electrical contractors from Colorado, New Mexico, and Wyoming attended.

In stating this problem and suggesting methods for its solution, Mr. Davis was doing more than merely outlining a plan to a group of sympathetic listeners. He was, himself, selling the air conditioning idea to his listeners. Little interest has been evidenced as yet in modern, scientific regulation of the quality of air by electrical contractors in this region. The number of adequate installments in the entire region is almost negligible. The general attitude is one of waiting until the air conditioning idea somehow creeps in and sells itself

The speaker stated that the purpose of air conditioning is to maintain proper moisture, heat, and purity in the air at all times and that even in the most ideal climate proper equipment is necessary to attain this goal. He quoted weather bureau data to show the extremes of heat and humidity "even in Colorado" in summer months. He gave three examples—a restaurant, a theater, and a business conference room—to illustrate how heat from fixtures, such as lights, stoves, coffee urns, and heat and perspiration from human bodies create sluggish, unhealthful air conditions and add to the load.

C. S. Newell, president of the Electrical League of Colorado, and G. B. Buck, president of the Rocky Mountain Electrical Association, jointly directed the conference.

James D. Erskine

NEW YORK—James D. Erskine, president of Erskine Heat Products, Inc., died April 19 following an operation for acute appendicitis. He was 58 years of age.

Born in Chicago, Mr. Erskine served as president of Erskine Copper Radiator Corporation, and previous to that, as president of Rome Brass Radiator Corporation.

He is survived by his wife, mother, and three children.

Abraham O. Frick

WAYNESBORO, PA.—Abraham O. Frick, chairman of the board of Frick Company, and active in the affairs of the company for more than sixty years, died in Baltimore April 20.

Born in Ringgold, Md., June 16, 1852, Mr. Frick was educated in the public schools of Waynesboro, where his father moved in 1861. He began work as an apprentice in the Frick shops at the age of 15, serving in turn as foreman, draftsman, and mechanical engineer.

In the early 80's Mr. Frick made the drawings for the original refrigerating machines with which the firm pioneered in this field. Becoming a charter member of the A.S.M.E. in 1885, he was a member continuously for nearly 50 years.

Mr. Frick became vice-president in 1896 and was elected president in 1904 of Frick Company. He had been chairman of the board since 1924.

He is survived by his wife, a sister, and two brothers.

Joseph A. Waddell

CHICAGO—J. A. Waddell, chief engineer of Spencer Heater Company and in charge of sales for the company in

The late Joseph A. Waddell

the western district, died suddenly in St. Louis April 28, while in that city on business. He was 56 years of age.

Mr. Waddell had been chief engineer of Spencer from 1903 to 1917 and again from 1927 to the time of his death. In 1933 he was placed in charge of sales for the western district with offices in Chicago.

He is survived by his widow and two children.

Cass Gilbert

LONDON—Cass Gilbert, famous New York architect, well known for his design of the Woolworth Building, died suddenly May 17 at Balmer Lawn Hotel, Brockenhurst, New Forest, near Southampton, on the eve of his return to the United States. Mr. Gilbert, who was 74 years of age, suffered a heart attack. He is survived by his widow, two daughters, and a son.

CORRESPONDENCE

A Message from Japan

EDITOR, HEATING AND VENTILATING:

I am sending you under separate cover a photograph taken at a restaurant here in Osaka "Nodaya" when a welcome luncheon in honour of Mr. and Mrs. J. P. Cosgrove of American Radiator Company was held on March 16th, 1934, and hope you will utilize it for publication.

The luncheon was sponsored by the "Toka-Kai," a social club composed of heating and domestic engineers and contractors of Western Japan.

In the course of his welcome greetings, Mr. S. Takasu, chairman of the club and the proprietor of the Asahi Kogyo-Sha, one of the biggest heating and ventilating contractors in Japan, said, in part: "The Japanese heating industry owe greatly to the good services American Radiator Company has rendered for so many years in the past and especially do we appreciate the kindness shown by Mr. Cosgrove whose position it is to transact with foreign countries, and it is our sincere desire that American Radiator Company and Mr. Cosgrove will continue the same spirit of friendship toward the development of heating industry of Japan as we believe there will be still much to be learned from America . . ."

In response, Mr. Cosgrove stood and said in a friendly manner, "I thank you most cordially for the honor and kindness you have extended to Mrs. Cosgrove and myself here this afternoon. As I have told in Tokyo our present trip to Japan does not imply any business proposition. I know very well that Japanese industry has made such a remarkable progress in recent years that at present she does not need to rely upon foreign countries for the supply of heating products. In as early as 1893, my father was engaged in shipping to Japan some of the first boilers to go to Japan, and I am always specially interested in the development of the heating industry of Japan. As you know American Radiator Company is a wealthy company, and has the best research laboratory in the world and therefore is in a position to benefit the heating industry of the world and if you require any assistance from us in future, we will gladly cooperate with you as heretofore . . ."

Both speeches were interpreted by Mr. K. Takeda of Okura & Company, agents of the American Radiator Company for Japan.

Very pleasant feeling prevailed all through the time, and by taking the commemorating photograph, shook hands saying "Sayonara" (Good-bye).

As I am convinced the above will at the same time be of great interest to you in view of the fact that the need of Japan-America amity is highly and enthusiastically advocated at this time.

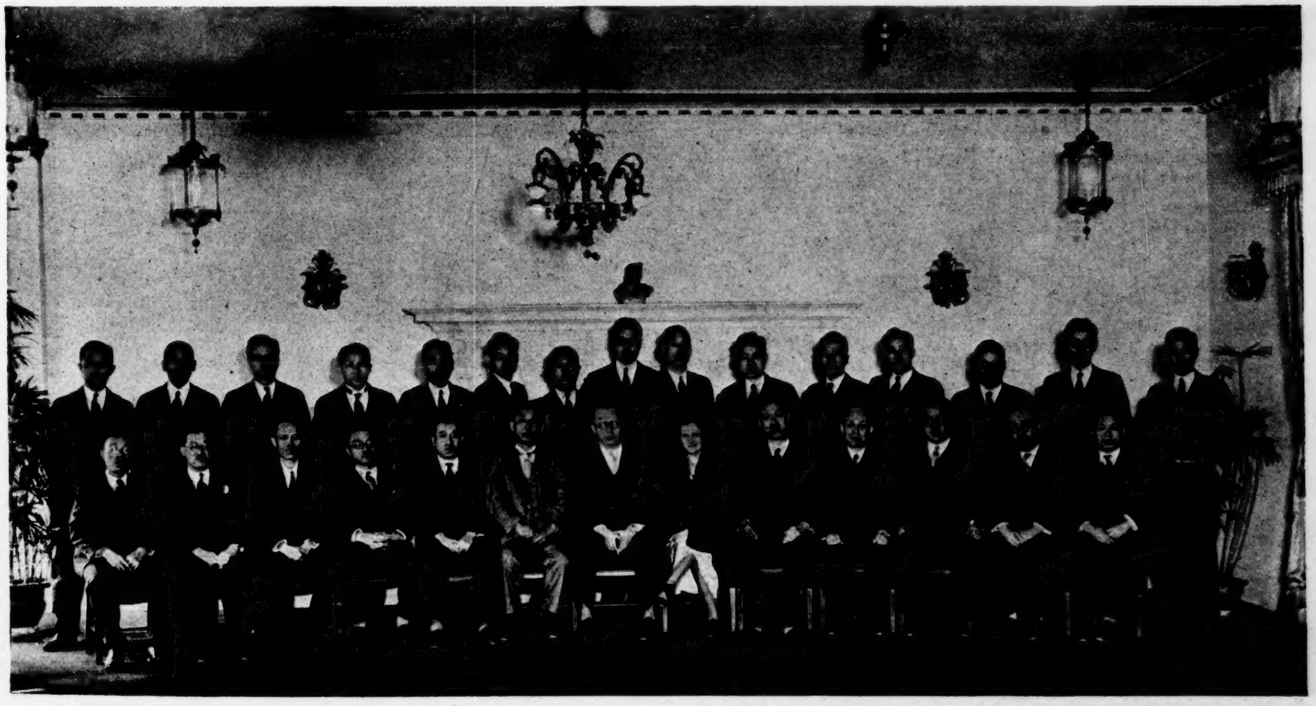
Just this morning, before I left my house for our office, I heard the radio addresses of American Ambassador Joseph C. Grew and Viscount Kikujiro Ishii, former Japanese Minister for Foreign Affairs, in commemoration of the 80th Anniversary of the signing of the Kanagawa treaty, a provisional pact between the Tokugawa Shogunate and Commodore Matthew Galbraith Perry and believe you also have heard the addresses in your country.

I was indeed prompted to write this letter just because I am fully convinced that Japan and the United States of America must go hand in hand for the welfare of mankind.

Yours faithfully,

K. TAKEDA.

Okura & Co., Ltd.
Osaka, Japan.



Members of Toka-Kai, an organization of heating engineers and contractors of western Japan. Mr. and Mrs. Cosgrove in front center. Mr. Takeda is directly behind Mr. Cosgrove.

NEW EQUIPMENT

Ideal Perfect Seal

A non-soluble, non-corrosive, and non-oxidizing compound has been announced by the Ideal Commutator Dresser Co., Industrial Div., Sycamore, Ill. The compound is in paste form and can be spread as thin as .001 in. It is used in connection with gaskets or as a seal for flanged or threaded joints in fuel, oil, steam, water, or air lines. It is said to be unaffected by atmospheric conditions and is heat-resisting up to 400°.

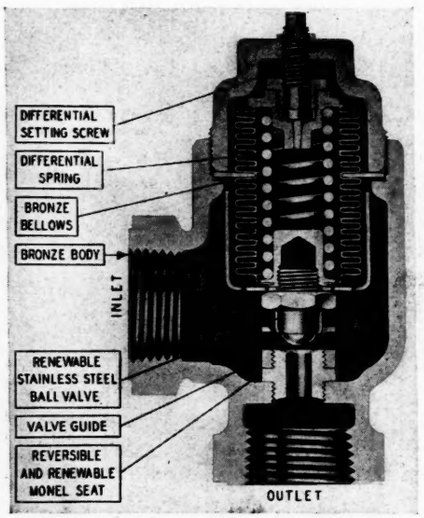
The compound is available in 3 oz. and 8 oz. tubes, 4-lb. pails, and in 45-lb. and 135-lb. drums.

Tag Steam Traps in Three Sizes

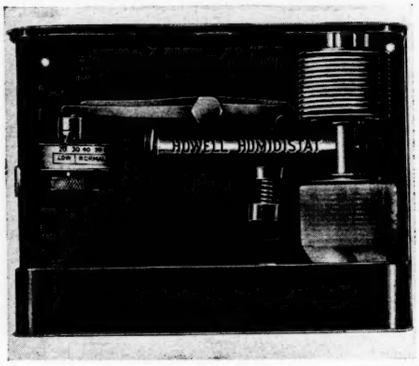
C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn, N. Y., has brought out an improved thermostatic steam trap for industrial use. These are offered in ½, ¾, and 1 in. sizes with greater capacity and far greater steam economy.

The Tag differential setting feature has been retained and assures saving of steam. An adjusting screw located at the top of the trap may be set to discharge condensate at a temperature corresponding to as much as 20 lb. less than the operating steam pressure, whether it is 50, 75, or 125 lb., without any further adjustment.

Other outstanding advantages are the renewable and reversible double life monel seat, and a renewable stainless steel ball valve, the ball of which is true to within five hundred-thousandths of an inch. As a further protection the renewable valve guide holds the ball valve central to the seat and thus insures tight closing.



Section of Tag steam trap



Howell humidistat

Howell Humidistat

A new type of humidistat for use with air conditioning systems has been announced by the Elliott-Wehner Foundry & Mfg. Co., 1625 Cleveland Ave., Kansas City, Mo. It is known as the Howell Humidistat and can be supplied housed in a chromium-plated case for residential use or without a case for duct installations in industrial or public buildings.

The instrument is built without resorting to the use of hydroscopic materials and will respond to changes of 1% in the relative humidity. The action of the humidistat depends upon a pair of opposite sylphons. which are perfectly balanced and charged with a gas that instantly responds to moisture changes in the atmosphere. The expansion and contraction of the wet sylphons, due to changes in atmospheric conditions, operate a control entirely enclosed and sealed in a vacuum to prevent corrosion and static.

Mason-Neilan Recording Thermometer

A recording thermometer has been announced by Mason-Neilan Regulator Co., 1190 Adams St., Boston. This recorder is furnished in an attractive square duralumin case with chromium-plated hinges and hasp. It is equipped with floating coil clamp, which it is said increases its accuracy by eliminating friction and lost motion.

These instruments may be equipped with the over-heat protector, a safety feature which definitely protects the thermal element if temperatures exceed the instrument range. It is claimed that with this protector excess temperatures of 500° over the maximum chart range will cause no damage.

Recorders with multiple pens for recording several different temperatures can be furnished if desired. All parts are standardized and are interchangeable with the company's other temperature control instruments.

Expansion Joint Made Adaptable to All Pressures

The piston ring expansion joint recently announced by the American District Steam Co., N. Tonawanda, N. Y., has been applied, in so far as the piston ring idea is concerned, to almost the entire line of Adsco expansion joints in pressure ranges of 125 lb., 250 lb., and 400 lb.

The maker has incorporated for the various pressure designs those special features which have previously been employed in its joints, such as non-corrosive gland studs and nuts, correctly proportioned stuffing box, for all sizes and pressures, machined external guide in one piece for 125-lb. and 250-lb. design, and a special two-piece guide for the 400-lb. joint.

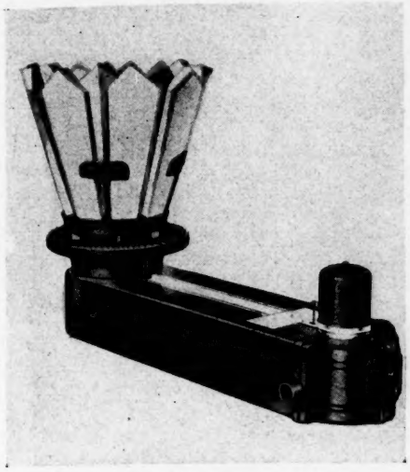
In addition, some minor improvements have been made, such as an enlarged relief chamber from which the vent relieves accumulated pressure prior to removing the gland for addition of packing.

Coppus Window Air Filter

Coppus Engineering Corp., Worcester, Mass., has placed on the market a window air filter designed to supply a continuous stream of filtered, outside air and at the same time keep out street noises. Unit has a capacity of 200 c.f.m. and is 99% efficient in removing ragweed pollen in concentrations found in the air during the hay fever season.

The fan, which is of the multivane type, is driven by a 1/50-hp. motor using less than 40 watts. The cabinet is of rustproof metal and can be furnished with any standard wood grain or color baked enamel finish.

Coppus window filter



Surface Combustion conversion burner

Janitrol Gas Conversion Burner

An unusual type of conversion gas burner has been announced by the Surface Combustion Corp., Toledo, Ohio. Designed especially with the idea of creating sonsumer desire, the new Janitrol combines attractive appearance and simplicity of operation.

Besides improving the appearance, the concealing of the control apparatus in one housing has other definite advantages. It conveys the idea to the average man that heating his home by gas is as simple as burning gas in a kitchen stove. It also serves to protect the parts from dirt and damage due to carelessness or tampering.

Other features include the aluminum piston alloy construction which provides strength and durability with a minimum of weight, electrical lighting for the pilot flame, finger tip control, and new design of burner for reduction of noise accompanying both the ignition and extinguishing of the flame.

Hays Portable Gas Calorimeter

The Hays Corp., Michigan City, Ind., has introduced a portable gas calorimeter for determining the heat content of gases.

Rapid determination of the heating value is possible with this apparatus. About 5 min. are required for the first test on any particular day but subsequent determinations can be completed in from 1 min. to 2 min. No special training is necessary and with careful handling determinations accurate to within 1% for manufactured gases and 2% for gases with higher heating values are easily obtained.

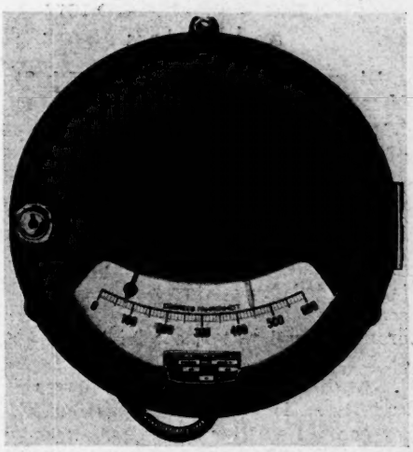
Use of the instrument is not confined to the determination of the heating value of the gases alone. It may also be used to ascertain the amount of combustibles unburnt in whole gases, for adjusting gas burners for correct air-gas mixtures, for determining the explosive properties of gases, and for many other purposes.

Indicating Thermometer Controller

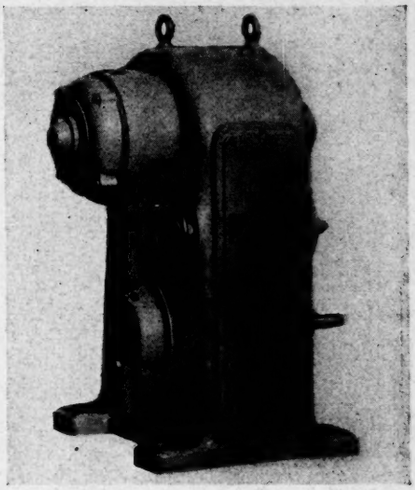
Use of mercury switches to eliminate open make-and-break contacts controlled by the pointer is a feature of an automatic control indicating thermometer announced by The Brown Instrument Co, Philadelphia. In this device, every 6 sec. a motor-driven control table determines the location of the pointer in reference to the control setting, and tilts the mercury switch from one side to the other if the temperature has changed.

The measuring mechanism is free to position itself unhampered by the control mechanism. There is no excess weight on the pointer, no distortion or restriction of pointer movement. The making of control contacts is not dependent upon friction, because the switch is positioned with a positive action by the electric motor. Contacts are unaffected by vibration because the mercury switch is mechanically locked in place until a different position is required.

These thermometers are equipped with the same measuring system and control mechanism supplied with the company's recording control thermometers. This type of instrument has given excellent service in installations where it was desirable to measure temperature at a distance up to 200 ft. and at the same time control the temperature or signal an alarm when the temperature gets beyond certain limits. Scales can be read at a considerable distance.



Brown thermometer-controller



Upright variable-speed motor

Sterling Upright Vari-Speed Motors

A line of upright Vari-Speed enclosed motors has been placed on the market by Sterling Electric Motors, Inc., Telegraph Road at Atlantic Blvd., Los Angeles, Calif.

This line of motors obtains its speed range by using a V-belt running on two V-pulleys mounted on fixed parallel shafts. The actuating of a small hand wheel simultaneously changes the diameters of both pulleys and at the same time automatically maintains the belt at the proper tension. The new line is available in ratings up to 15 hp.

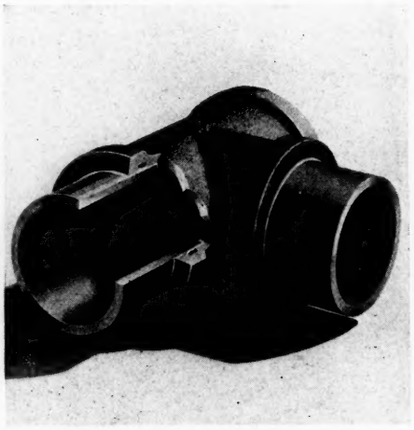
Walseal Threadless Bronze Fittings

Through the collaboration of the Air Reduction Sales Company, Walworth Company, and Handy and Harmon, a threadless bronze pipe fitting has been announced. It will be manufactured exclusively by Walworth. It incorporates in each opening of the fitting a ring of brazing alloy, known as Sil-Fos. The job of installing consists merely of slipping the pipe into the fittings, then applying the oxy-acetylene flame in the proper manner until the white Walseal ring appears as shown in the illustration between the pipe and the fitting outlet.

The Sil-Fos flows out between the fitting and the pipe in both directions from the ring. The proper quantity of brazing alloy is included in each outlet.

Should it be necessary to remove the fitting it can be used again by merely repeating the operation employed in making the original joint because there is sufficient brazing alloy to make two complete joints.

This fitting is said to be the only threadless bronze fitting made for



Threadless bronze fitting

standard-iron-pipe size and extra heavy brass and copper pipe. Walseal bronze fittings are available in the extra heavy pattern.

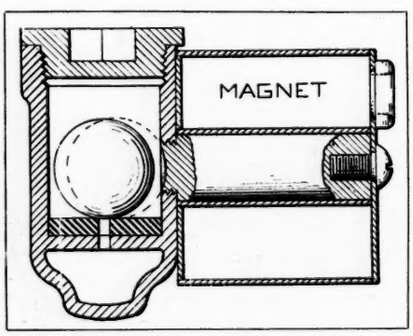
Hoppe Electrically-Controlled Valves

Myers Engineering Equipment Co., 401 South 12th St., St. Louis, has announced two new types of electrically-operated valves known as the Hoppe electro-hydraulic valve and the electro-magnetic valve. Both types utilize hydraulic pressure for shutting off the flow.

The electro-hydraulic valve is made in four sizes from ¼ in. to 1 in. in diameter, while the electro-magnetic type is made at the present time only in the ¼-in. size. Both can be furnished with either a high-grade steel bronze or non-magnetic iron body. The coils can be wound for any current, high or low voltage. Up to the present time both valves have been installed in systems using ammonia, air, carbon dioxide, F-12, steam, or water.

Operation of the main shut-off valve in the electro-hydraulic type is controlled by the position of a steel ball. When the current is turned on, the steel ball is moved off its seat, thus relieving the pressure on the main shut-off valve. The liquid pressure then lifts the valve, allowing the liquid to flow. When the current is cut off, the steel ball falls into its seat, cutting off the flow through the by-pass. The liquid then builds up a pressure behind the main valve and forces it down on the seat.

Electro-magnetic valve consists simply of a magnetically-operated steel ball. The ball is moved off the seat by the magnetic force of the solenoid which allows the liquid to flow. Cutting off the current allows the ball to fall into the seat and stop the flow.



Hoppe magnetic valve

Motor Wheel Conversion Oil Burner

A low-price, pressure-atomizing, conversion type oil burner has just been added by the Heater Div., Motor Wheel Corp., Lansing, Mich., to its line.

Identified as the MW Emancipator, the burner is finished in one model flexible enough to meet all domestic heating plant requirements. Advantages cited include: aluminum casings of modern streamline design and smartness, smooth, quiet operation due to a built-in silencer, radio interference eliminator, and ease of installation.

The unit is designed to operate on No. 3 oil with a burner capacity of from 1.35 to 4 g.p.h. It employs a 1/6 hp. direct-drive Emerson motor, new Webster transformer, Tuthill pump, Detroit Lubricator pressure relief valve and strainer, Draft-a-Justor draft regulator, and Wilson interchangeable nozzles. Mercoid or Minneapolis-Honeywell controls are optional.

In addition to furnishing this burner as a conversion unit, the company has adopted it as standard equipment on its 800 series boiler-burner units and also on its forced warm-air heating and ventilating units.

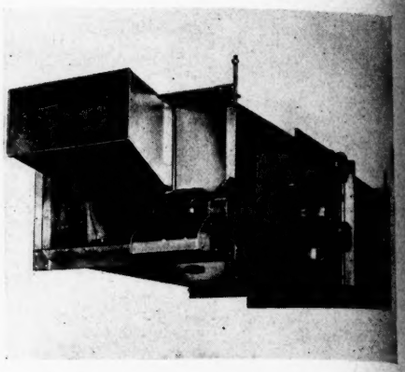
Literature describing both the burner and the complete matched-unit equipment is available and may be obtained by writing the Heater Div., Motor Wheel Corp., Lansing, Mich.

Niagara Air Conditioners and Heaters

Niagara Blower Co., 6 East 45th St., New York, has announced several new types of apparatus for air conditioning and heating.

For complete summer and winter air conditioning of stores, restaurants, offices, and assembly rooms the Niagara Type C unit is offered, Series 2000. This unit is made entirely of aluminum and is intended for ceiling suspension. It requires connections to steam, refrigerant or cold water, electricity, and a drain.

The disk fan room coolers, Types D and M, Series 4000, are recommended for cooling smaller shops, restaurants, and offices. These units are also of the ceiling suspension type and distribute cold air directly without ducts. They can use any type of refrigerant and require a connection to an electric socket. The casing, fan, louvers, and eliminators are of bright aluminum plate, giving long life and handsome appearance.



Niagara Type C conditioners

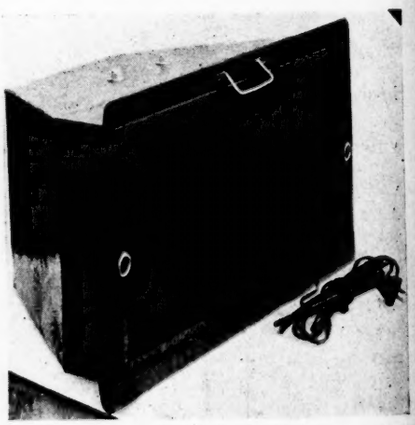
For industrial use, the company offers the Type A Series 400 air conditioner. This unit is intended for precise control applications in process industries. It furnishes complete air conditioning and is capable of maintaining constant temperature and humidity conditions over wide ranges.

The duplex damper fan heater, Series 700, 800, and 900, provides accurately controlled heating for factory applications.

Perfex Milwaukee Air Filter

Perfex Corp., Milwaukee, Wis., has placed on the market a window air filter, known as the Milwaukee air filter. The unit, which is designed to relieve hay fever and pollen asthma, supplies 11,000 cu. ft. per hr. of clean air.

An unusual feature is that the motor and fan are installed outside the window and are rubber mounted to give quiet operation. The entire unit is housed in a green crackle finish non-rusting metal cabinet.



Perfex window filter

NOW'S THE TIME *to install* MONEY-SAVING PIPE

Heating contractors can profit by economy in installation—the owner profits by long trouble-free service.

The contractor will save time and money for himself by working with NATIONAL Pipe. Threading, cutting, installing, tightening up, and final inspection are so quickly accomplished with this exceptionally well made, smoothly finished pipe that the immediate gain is very clear.

The property owner's interest will be served because of the extra tight, extra secure, extra durable job that results when NATIONAL Pipe is installed.

Reputation, good will, and a profitable business may be expected to grow up where such materials are combined with sound workmanship. Make NATIONAL Pipe your standby. Produced with unrivaled facilities by the largest manufacturer of wrought pipe in the world. Meets all standard specifications. Recognized everywhere as—

America's Standard Wrought Pipe For Heating Purposes

NATIONAL TUBE COMPANY · PITTSBURGH, PA.

Subsidiary of United States Steel Corporation

Check these 10 outstanding advantages of NATIONAL PIPE

1. *Completely uniform.*
2. *Strong and ductile.*
3. *Threads easily.*
4. *Flanges readily.*
5. *Coils and bends well.*
6. *Sound joints.*
7. *Available in copper-steel.*
8. *Scale-free.*
9. *Spellerized.*
10. *Rigidly tested and inspected.*

NATIONAL PIPE

Degree-Days for Eastern Cities Running Above Last Year

April, 1934

	Atlanta	Baltimore	Birmingham	Boston	Buffalo	Chicago	Cincinnati	Cleveland
Degree-days for April, 1934	167	337	127	512	667	494	353	533
Degree-days, Sept. 1, 1933 to Apr. 30, '34	2832	4704	2275	6293	7091	5964	4983	6036
Degree-days, Sept. 1, 1932 to Apr. 30, '33	2816	3974	2469	5034	5978	5858	4741	5231
Comparison, season to date with last, %	+ 0.6	+ 18.6	— 7.8	+ 24.8	+ 18.3	+ 1.8	+ 5.2	+ 15.4
Degree-days, Sept. 1 to Apr. 30, Normal	2890	4511	2352	5800	6474	6042	4684	5935
Comparison, season to date with nor'l, %	— 2.1	+ 4.2	— 3.3	+ 8.4	+ 9.4	— 1.2	+ 6.4	+ 1.6
Lb. coal per sq. ft. rad., April, 1934	1.336	2.696	1.016	4.096	5.336	3.952	2.824	4.264
Gal. oil per sq. ft. rad., April, 1934	0.115	0.231	0.087	0.351	0.457	0.339	0.242	0.365
Cu. ft. gas per sq. ft. rad., April, 1934	16.03	32.35	12.19	49.15	64.03	47.42	33.89	51.17

	Davenport	Dayton	Denver	Des Moines	Detroit	Duluth	Fort Wayne	Grand Rapids
Degree-days for April, 1934	414	407	410	403	628	832	525	624
Degree days, Sept. 1, 1933 to Apr. 30, '34	5864	5436	4141	5903	6639	9223	6232	6754
Degree-days, Sept. 1, 1932 to Apr. 30, '33	5888	5007	5688	6214	5895	9046	5782	6121
Comparison, season to date with last, %	— 0.4	+ 8.6	— 27.2	— 4.9	+ 12.7	+ 2.2	+ 7.9	+ 10.3
Degree-days, Sept. 1 to Apr. 30, Normal	6171	5183	5607	6266	6264	8721	5804	6361
Comparison, season to date with nor'l, %	— 5 0	+ 4.8	— 26.3	— 5.7	+ 5.8	+ 5.8	+ 7.4	+ 6.2
Lb. coal per sq. ft. rad., April, 1934	3.312	3.256	3.280	3.224	5.024	6.656	4.200	4.992
Gal. oil per sq. ft. rad., April, 1934	0.284	0 279	0.281	0.276	0.431	0.571	0.360	0.428
Cu. ft. gas per sq. ft. rad., April, 1934	39.74	39.07	39.36	38.69	60.29	79.87	50.40	59.90

	Harrisburg	Hartford	Indianapolis	Kansas City	La Crosse	Los Angeles	Louisville	Memphis
Degree-days for April, 1934	428	482	387	236	544	41	278	115
Degree days, Sept. 1, 1933 to Apr. 30, '34	5644	6326	5417	4336	7024	819	4360	2881
Degree-days, Sept. 1, 1932 to Apr. 30, '33	4892	5323	5149	4765	7150	1301	4230	3055
Comparison, season to date with last, %	+ 15.3	+ 18 8	+ 5.2	— 9.2	— 1.8	— 37.2	+ 3.1	— 8.6
Degree-days, Sept. 1 to Apr. 30, Normal	5285	5834	5239	4840	7139	1414	4180	2950
Comparison, season to date with nor'l, %	+ 6.8	+ 8.6	+ 3.7	— 10 6	— 1.6	— 42.3	+.4.3	— 2.3
Lb. coal per sq. ft. rad., April, 1934	3.424	3.856	3.096	1.888	4.352	0.328	2.224	0.920
Gal. oil per sq. ft. rad., April, 1934	0.293	0.331	0.265	0.162	0.373	0.028	0.191	0.079
Cu. ft. gas per sq. ft. rad., April, 1934	41.09	46.27	37.15	22.66	52.22	3.94	26.69	11.04

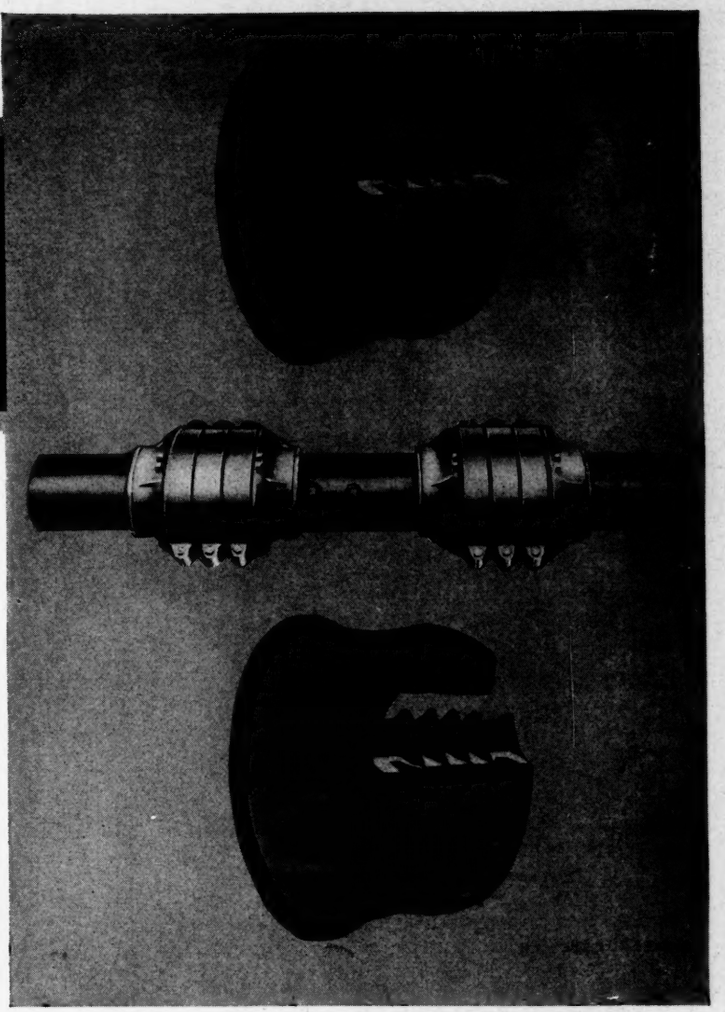
	Milwaukee	Minneapolis	New Haven	New Orleans	New York	Omaha	Peoria	Philadelphia
Degree-days for April, 1934	597	595	501	11	463	315	406	356
Degree-days, Sept. 1, 1933 to Apr. 30, '34	6586	7501	6067	854	5551	5364	5756	4946
Degree-days, Sept. 1, 1932 to Apr. 30, '33	6466	7632	5152	1093	4656	5774	5643	4113
Comparison, season to date with last, %	+ 1.9	— 1.7	+ 17.8	— 22.0	+ 19.3	— 6.9	+ 2.2	+ 20.3
Degree-days, Sept. 1 to Apr. 30, Normal	6856	7614	5672	1024	5192	6047	5988	4787
Comparison, season to date with nor'l, %	— 3.9	— 1.4	+ 7.1	— 16.7	+ 7.1	— 11.2	— 3.7	+ 3.3
Lb. coal per sq. ft. rad., April, 1934	4.776	4.760	4.008	0.088	3.704	2.520	3.248	2.848
Gal. oil per sq. ft. rad., April, 1934	0.409	0.408	0.344	0.008	0.317	0.216	0.278	0.244
Cu. ft. gas per sq. ft. rad., April, 1934	57.31	57.12	48.10	1.06	44.45	30.24	38.98	34.18

	Pittsburgh	Portland, Ore.	Providence	Reading	Rochester	St. Louis	Salt Lake City	San Francisco
Degree-days for April, 1934	439	177	480	430	607	266	231	180
Degree days, Sept. 1, 1933 to Apr. 30, '34	5613	3019	6171	5469	6904	4402	3904	1856
Degree-days, Sept. 1, 1932 to Apr. 30, '33	4939	4124	5194	4701	5745	4385	5964	2434
Comparison, season to date with last, %	+ 13.8	— 26.8	+ 18.9	+ 16.4	+ 12.1	+ 0.4	— 34.6	— 23.7
Degree-days, Sept. 1 to Apr. 30, Normal	5157	4134	5763	5293	6472	4585	5319	2418
Comparison, season to date with nor'l, %	+ 8.8	— 27.0	+ 7.2	+ 3.3	+ 6.6	— 3.8	— 26.6	— 23.3
Lb. coal per sq. ft. rad., April, 1934	3.512	1.416	3.840	3.440	4.856	2.128	1.848	1.440
Gal. oil per sq. ft. rad., April, 1934	0.301	0.121	0.329	0.295	0.416	0.182	0.158	0.123
Cu. ft. gas per sq. ft. rad., April, 1934	42.14	16.99	46.08	41.28	58.27	25.54	22.18	17.28

	Scranton	Seattle	Spokane	Syracuse	Toledo	Trenton	Washington, D. C.	Wichita
Degree-days for April, 1934	501	257	266	569	562	441	338	229
Degree-days, Sept. 1, 1933 to Apr. 30, '34	6390	3449	4672	6912	6357	5659	4714	3873
Degree-days, Sept. 1, 1932 to Apr. 30, '33	5438	4421	5961	5623	5766	4720	4047	4392
Comparison, season to date with last, %	+ 17.7	— 22.1	— 21.7	+ 23.0	+ 10.2	+ 12.1	+ 16.5	— 11.8
Degree-days, Sept. 1 to Apr. 30, Normal	5958	4397	5989	6614	5893	4852	4601	4673
Comparison, season to date with nor'l, %	+ 6.8	— 21.6	— 22.0	+ 4.6	+ 8.1	+ 16.8	+ 2.2	— 17.3
Lb. coal per sq. ft. rad., April, 1934	4.008	2.056	2.128	4.552	4.496	3.528	2.704	1.832
Gal. oil per sq. ft. rad., April, 1934	0.344	0.176	0.182	0.390	0.385	0.302	0.232	0.157
Cu. ft. gas per sq. ft. rad., April, 1934	48.10	24.67	25.54	54.62	53.95	42.34	32.45	21.98

Fuel consumption figures given above are based on certain conditions, and for other conditions corrections must be made. The figures assume the use of steam radiators emitting 240 B.t.u. per sq. ft. per hr., a system operating at 100% efficiency, and radiators calculated for maintaining 70° in zero weather. Heating values assumed for the fuels are 12,000 B.t.u. per lb. for coal, 1000 B.t.u. per cu. ft. for gas, and 140,000 B.t.u. per gal. for oil. To correct for other heating values, efficiencies, and design conditions, follow the method explained in the "Heating and Ventilating Degree-Day Handbook."

Badger Expansion Joints ...



Long-Life Joints Coupled with no Maintenance

Badger Expansion Joints have always had long life, but with the perfection of the Directed Flexing Feature, exclusive with these joints, the life has been considerably prolonged. Accelerated tests with this new design joint showed the life extended several times, the reason being that flexing stresses are distributed—not concentrated.

The "No Maintenance" feature comes from the fact they are the corrugated type of joint. No packing is used in any way.

Long-life and no maintenance . . . with these two features you are bound to get low-cost carrying of steam through your lines if you equip them with Badger Directed Flexing Joints.

•

Standard sizes 3" to 30" welding or flanged ends.
Monel sleeve for super-heated steam.

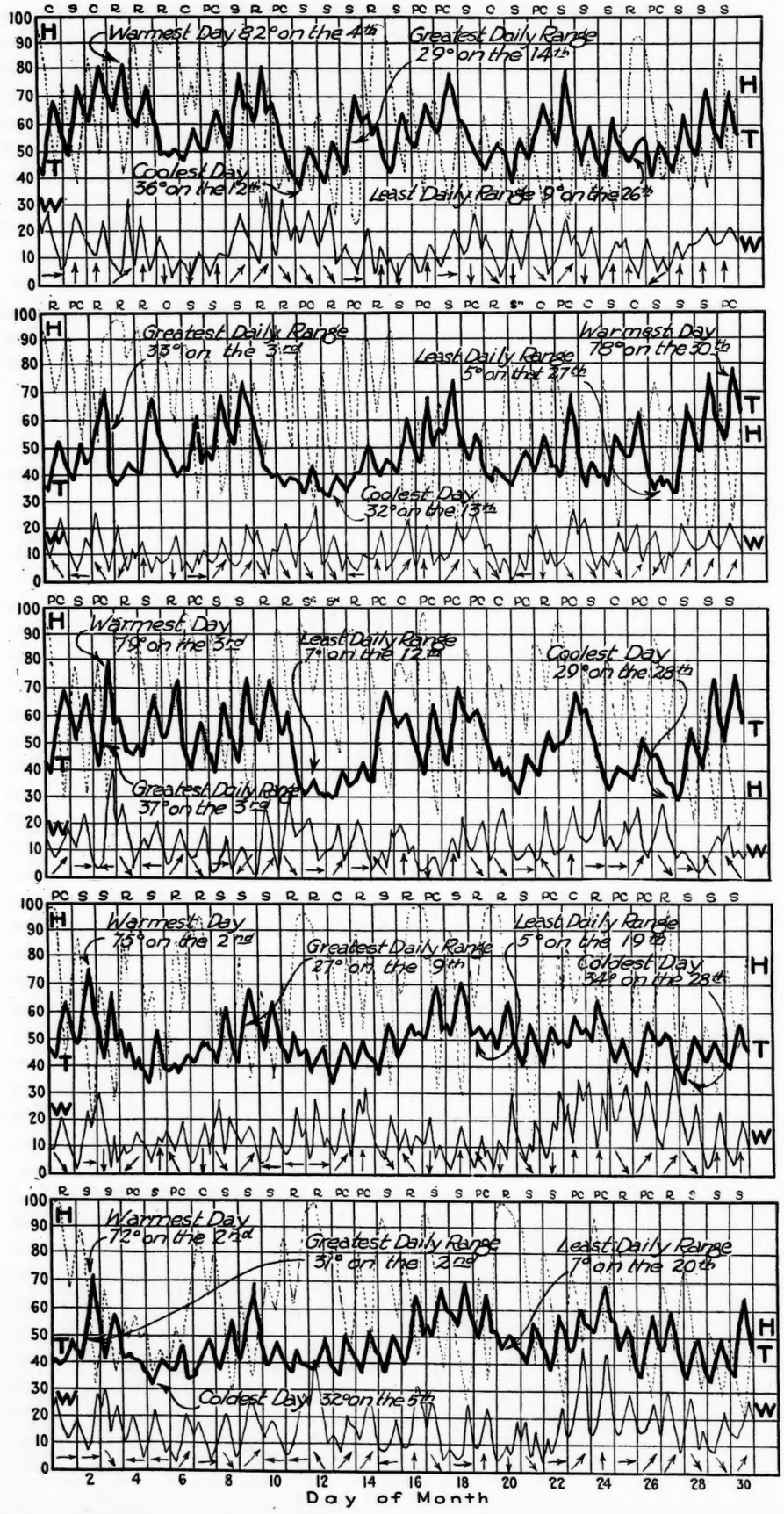
E. B. BADGER & SONS COMPANY, 75 Pitts Street, Boston, Mass.

Atlanta, Ga., 140 Edgewood Ave.
Charlotte, N. C., Independence Bldg.
Chicago, Ill., 2831 S. Parkway.
Cincinnati, Ohio, Union Trust Bldg.
Cleveland, Ohio, Guardian Bldg.
Detroit, Mich., 702 Cadillac Sq. Bldg.
Houston, Tex., 1308 Sec. Nat. Bk. Bldg.
Indianapolis, Ind., 823 Occidental Bldg.
Kansas City, Mo., 1336 Oak Street.
Los Angeles, Cal., 812 Quinby Bldg.
Minneapolis, Minn., 732 Build. Exch.
Montreal, Que., Can. Cement Bldg.
New Orleans, La., 1666 Abundance St.
New York, N. Y., 271 Madison Ave.
Philadelphia, Pa., 1500 Walnut St.
Pittsburgh, Pa., Union Trust Bldg.
Salt Lake City, Utah, Kearns Bldg.
San Francisco, Cal., Sharon Bldg.
Seattle, Wash., Smith Tower.
St. Louis, Mo., 3605 Laclede Ave.
Tulsa, Okla., 409 East Archer Street.

BADGER EXPANSION JOINTS

THE WEATHER FOR APRIL, 1934

Plotted from records especially compiled for HEATING AND VENTILATING by the U. S. Weather Bureau. Heavy curves (T), temperatures in deg. F.; dotted lines (H), per cent relative humidity, from readings at 8 a.m., noon, and 8 p.m., except for New York, which shows hourly readings. Light lines (W), wind velocity in m.p.h. Arrows indicate prevailing wind directions. S—clear; PC—partly cloudy; C—cloudy; R—rain; Sn—snow.


Warmest Day 82° on the 4th
Greatest Daily Range 29° on the 14th
Coolest Day 36° on the 12th
Least Daily Range 9° on the 26th
Greatest Daily Range 33° on the 3rd
Least Daily Range 5° on the 27th
Warmest Day 78° on the 30th
Coolest Day 32° on the 13th
Warmest Day 79° on the 3rd
Least Daily Range 7° on the 12th
Coolest Day 29° on the 28th
Greatest Daily Range 37° on the 3rd
Warmest Day 75° on the 2nd
Greatest Daily Range 27° on the 9th
Least Daily Range 5° on the 19th
Coldest Day 34° on the 28th
Warmest Day 72° on the 2nd
Greatest Daily Range 31° on the 2nd
Least Daily Range 7° on the 20th
Coldest Day 32° on the 5th
Day of Month

St. Louis

Mean temp. for month 57.0°; aver. wind velocity, 12.5 m.p.h.; prevailing direction of wind, S.

Chicago

Mean temp. for month, 48.6°; aver. wind velocity, 11.5 m.p.h.; prevailing direction of wind, S.W.

Pittsburgh

Mean temp. for month, 50.4°; aver. wind velocity, 10.5 m.p.h.; prevailing direction of wind, W.

New York

Mean temp. for month, 49.5°; aver. wind velocity, 13.7 m.p.h.; prevailing direction of wind, S.

Boston

Mean temp. for month, 48.0°; aver. wind velocity, 14.5 m.p.h.; prevailing direction of wind, S.W.

A 230 MILLION DOLLAR MARKET

A market that ranges from the minor equipment of the modern home to the vast systems required for the towering office building. A market that covers the enormous field of air conditioning for industrial plants –for stores, theatres, public buildings, schools, institutions–for transportation units–ships, railway trains, airplanes . . . A market created and supported by the modern trend–the modern *demand*. It is *your* market –and as an exponent of the various phases of air conditioning–the range, mechanics, problems, governing factors–HEATING AND VENTILATING is the Leading Paper in the Field.

Your advertising in HEATING AND VENTILATING gives your product the added selling push which can well be the making of a sale, and backs your selling force to the fullest extent.

AIR CONDITIONING
★ **HEATING** ★
VENTILATING

ACROSS THE SEAS

OR HERE
AT HOME

Century Motors have an international reputation. "They keep a-running" in all parts of the world, in all classes of service, in damp, humid climates or where temperatures cover an extreme high-to-low range...They are available in a wide variety of types and sizes — designed and built right to meet every operating condition...Sizes, 1/200 to 600 horse power... Century Engineers will gladly assist you in selecting the right motor for the application.

CENTURY ELECTRIC COMPANY
1806 Pine Street • • St. Louis, Mo.
Offices and Stock Points in Principal Cities

Century
MOTORS

Year's Progress in District Heating

(Continued from page 27)

is accounted for by the addition of new customers. New rate schedules became effective during the year. These rates, in addition to granting reductions, provide for the installation of orifices to limit the demand of the smaller size customers (500 lb. or below) and base the demand charge on the orifice capacity. A steam jet conditioning equipment of 50 tons capacity at the Benjamin Franklin Memorial Institute was connected to the district supply.

ROCHESTER: A 2½-in. high-pressure industrial steam line about 700 ft. long was constructed and put in service just at the beginning of cold weather in November. It is along the right of way of the New York Central Railroad and carried above ground for about two-thirds of its length. The remainder of the distance is covered with the line underground in conduit.

SCRANTON: Construction work during the year consisted of rebuilding 212 ft. of 12-in., 1723 ft. of 10-in., and 549 ft. of 6-in. line to replace wood log construction installed 30 years ago. New lines are steel pipe, welded, covered with 2-in. insulation waterproofed, in concrete conduit.

ST. LOUIS: Prospective extensions of service include various proposals for slum clearance and housing projects with steam to be supplied for heating and hot water requirements.

WINNIPEG: This municipally-operated system reports that in the steam heating division "there was a satisfactory surplus of $32,080.71, which enabled us to wipe out the accumulated deficits of past years and to start 1934 with a credit balance in the profit and loss account. In spite of an appreciable loss of business, owing to depressed conditions, the cold weather of 1933 enabled us to show the above satisfactory results."

In addition to the extensions and additions described above, construction work on district projects was under way at York, Pa., and at Boston. The work in Boston is described on another page in this issue.

Proposals of interest were those at Chicago and Duluth. It is also reported that a franchise has been granted at Vancouver but this is unconfirmed.

The largest single piece of distribution system construction was that at Washington which was done by the Treasury Department to provide a central steam service for Government buildings, and which is described elsewhere in this issue.

District heating in institutional plants included underground lines constructed by the city of St. Louis, by Washington University, St. Louis, and by the Baltimore City Hospital. Work at St. Louis included over ½ mile of 6-in. line and 1000 ft. of 8-in. high-pressure line; that at Baltimore of 1040 ft. of various sizes.

Modernizing Plan Goes to Congress

(Continued from page 48)

thus made available for loans on real estate and construction.

Modernizing Plans

In detail, the modernizing feature of the plan is of special interest. It is important to note the Government's plan of a campaign expected to take on some of the features of the Liberty Loan Drives and the intense publicity used by NRA last summer. The object is to draw public attention to the importance of modernizing. Another point which should be noted in this connection is that while the impression has gotten out that the modernizing campaign will be directed to residential property—this is not so. Loans will be made available to other properties besides residential. One point contained in the proposed act, and often overlooked, is that the home insurance corporation is authorized and empowered to insure modernization loans entered into by lending institutions prior to January 1, 1936. In other words, the campaign must get underway and be finished in the next 18 months.

It is not at all clear as yet exactly what the plan means in practical terms. John Fahey, of the Home Loan Board, is authority for the opinion that in case of repairs and modernization the procedure would be as follows: The building owner will merely sign a note and the loan made will not be regarded as a lien on his property. No endorsement will be required. The loans would be payable over a period of five years on the installment plan. He also stated that associations and banks, building and loan groups, and similar interests have agreed to cooperate in popularizing the modernization program.

New Catalogs

Air Controls Inc., 1960 West 114th St., Cleveland, has published Engineering Bulletin No. 16, "A C Blowers for Air Conditioning." The bulletin contains complete engineering data sheets, together with a group of simplified selector charts arranged in tabular form for easy reference. One chart coordinates the furnace size, pipe area and c.f.m., another tells the proper static pressure to use for various sizes and types of systems. Dimension drawings of the blowers with and without by-pass louvers are included.

Bailey Meter Co., 1050 Ivanhoe Road, Cleveland, has published a 32-page bulletin entitled "Savings Effected by Bailey Boiler Meters." It includes operating data showing the nature and amount of savings effected in 20 typical installations of the company's meters.

The Carbondale Machine Co., Carbondale, Pa., has published Bulletin 1233, "Carbondale Duplex Vertical Ammonia Compressors." The booklet illustrates and describes all details of these machines; standard size; 12 pages.

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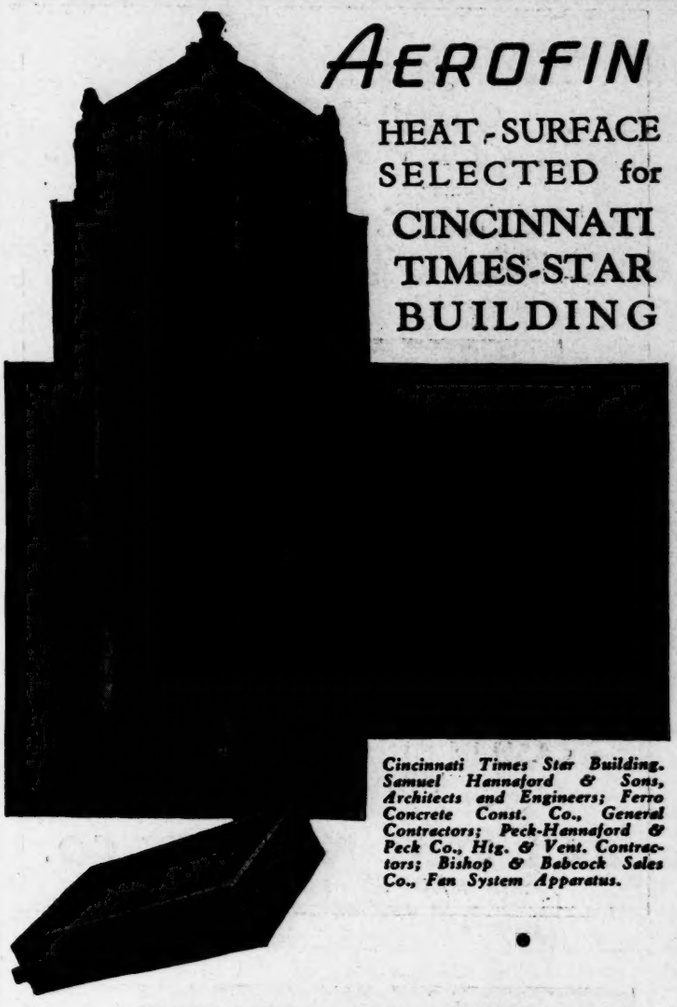

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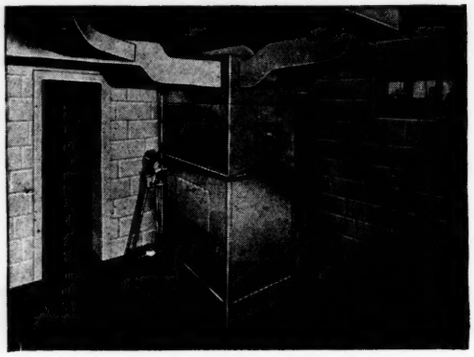

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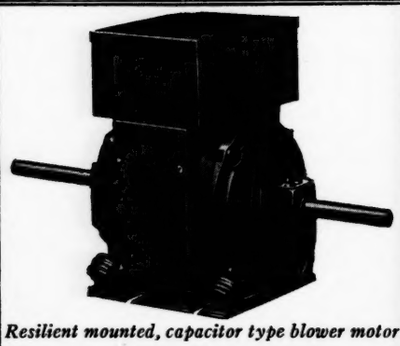

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Decatur Pump Co., Decatur, Ill., has published catalog No. 34 on its line of Burks pumps. Included in the bulletin are super-turbine water pumps, gasoline pumps, water systems, condensation return pumps, centrifugal pumps, and accessories; standard size, 32 pages.

Ess Instrument Co., 816 Agnes St., Parkersburg, W. Va., has published four-page Bulletin 341, describing its line of combustion indicators including Hazegage, Smokguide, Airguide, and Smokhorn.

Neiler, Rich & Company, engineers in Chicago, have published a booklet "Forty Years of Engineering Experience," describing the firm's activities and listing the reports and plans which they have prepared; 19 pages.

Penn Electric Switch Co., 2000 East Walnut St, Des Moines, Iowa, has published a standard-size, 27-page catalog describing and illustrating the company's new Temtrol, a temperature regulator. The book contains engineering data relating to the advantages of controlling room temperatures from a point near the floor.

Republic Steel Corp., Youngstown, Ohio, has issued Bulletin 120 on Republic Galvannealed Sheets, which explains the metallurgical reasons for the adherence of the zinc coating on the company's sheets and details the desirable characteristics of the sheets. A number of recommended applications are listed and illustrated. Size data are included.

The Ric-wiL Co., Union Trust Building, Cleveland, has published a folder on central heating with Ric-wiL conduit for colleges, hospitals, and institutions. The folder illustrates and briefly describes numerous installations, and describes in some detail the maker's system for underground steam lines.

United States Radiator Corp., Detroit, has published four loose-leaf standard size bulletins on its boilers covering the Capitol Red Top A Series, B Series, C Series, and the Capitol Black Top boilers for small homes. Sectional views are presented in color, together with a description of dimensional and capacity data.

United States Radiator Corp., Detroit, has published a new catalog, "Capitol Radiators," a 16-page loose-leaf booklet in color, containing capacity and dimensional data on the company's line of direct cast-iron, tubular, and wall radiators.

Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, has published two looseleaf bulletin sheets known as Bulletin 167, Part 8, describing direct-current motors made by the company.

Whitney Stoker Co., Bridgeport, Conn., has published a number of folders describing the company's anthracite-burning stoker.

Worthington Pump and Machinery Corp., Harrison, N. J., has published a six-page folder describing the company's line of horizontal duplex refrigeration compressors.

Young Radiator Co., Racine, Wis., has published a folder illustrating new lines of unit coolers, heater-coolers, and chilling units. These products lend themselves to almost any type of air conditioning installation. The units shown in the folder may be used in connection with the present refrigerating system. Any common refrigerant may be used as the cooling agent.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, has issued its booklet No. 18, "Matched Thread Perfection," a profusely illustrated bulletin describing characteristics of the company's pipe and research work which has been done on threading and cutting steel pipe.

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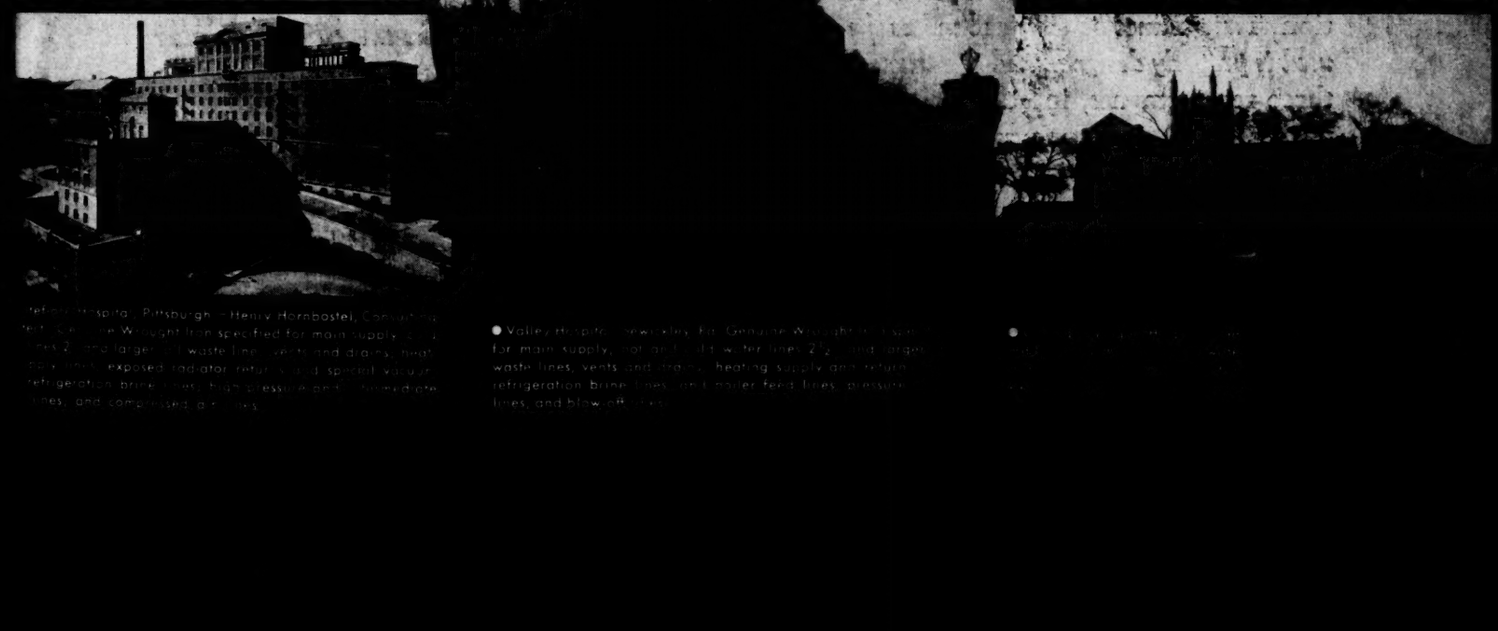

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